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THE BUILDER

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*Kirkstall Abbey.**

NEXT after Fountains, there is no Cistercian Abbey in this country that can compare in completeness of plan with Kirkstall, nor is there any that illustrates so well the normal plan and arrangement of a Cistercian monastery. As at Fountains, we have here not only the circuit of the buildings round the cloister, but the important group of the infirmary on the east, and an interesting section of the hospitate and menial buildings on the west.

One of the numerous colonies that emanated from the mother-house of Fountains, the monastery was first established by Henry de Lacy, the founder, in 1147, at a place called Barnoldswick, about nine miles from Skipton, with the pretty name of Mount St. Mary. The first abbot was Alexander, prior of Fountains, and his convent consisted of the usual twelve monks, with ten *conversi*, or working-brothers. The monastery was afterwards moved, with the consent of the founder, in 1152, to a place in Airedale, called Kirkstall, where it continued to flourish until its suppression on November 22, 1539. The first buildings at Kirkstall, as was so often the case, were of wood, but during the days of abbot Alexander, who ruled for thirty-five years, "the stone buildings of Kirkstall were erected, and the wooden ones taken down; that is to say, the church, both dorters, namely, of the monks and of the working-brothers, also both fraters, the cloister, the chapter-house, and other necessary offices within the abbey, and all these were excellently covered with tiles."* The founder is said to have "finished the whole fabric of the church at his own cost," having first himself laid the foundations thereof.†

Of the identical buildings here mentioned very considerable remains are still standing, and there is a marked absence of the reconstruction and enlargement of the original arrangement that is so noticeable at Fountains and Rievaulx.

The church is about 220 ft. long, and of the usual early Cistercian plan. It consists of an aisleless presbytery of two bays (but three externally), a central tower, north and south transepts, each with three eastern chapels, and a nave with aisles of eight bays. There was once a north porch. The cloister and other monastic buildings are to the south of the church. In the fifteenth century the high-pitched roofs were lowered and the gables remodelled, and a large east window was inserted, with two others in the nave to light the retro-choir. Early in the sixteenth century a story was added to the tower. Larger east windows were also inserted in the transept chapels, and some of the other windows divided by tracery. With these exceptions, the whole of the church is of late Norman work.

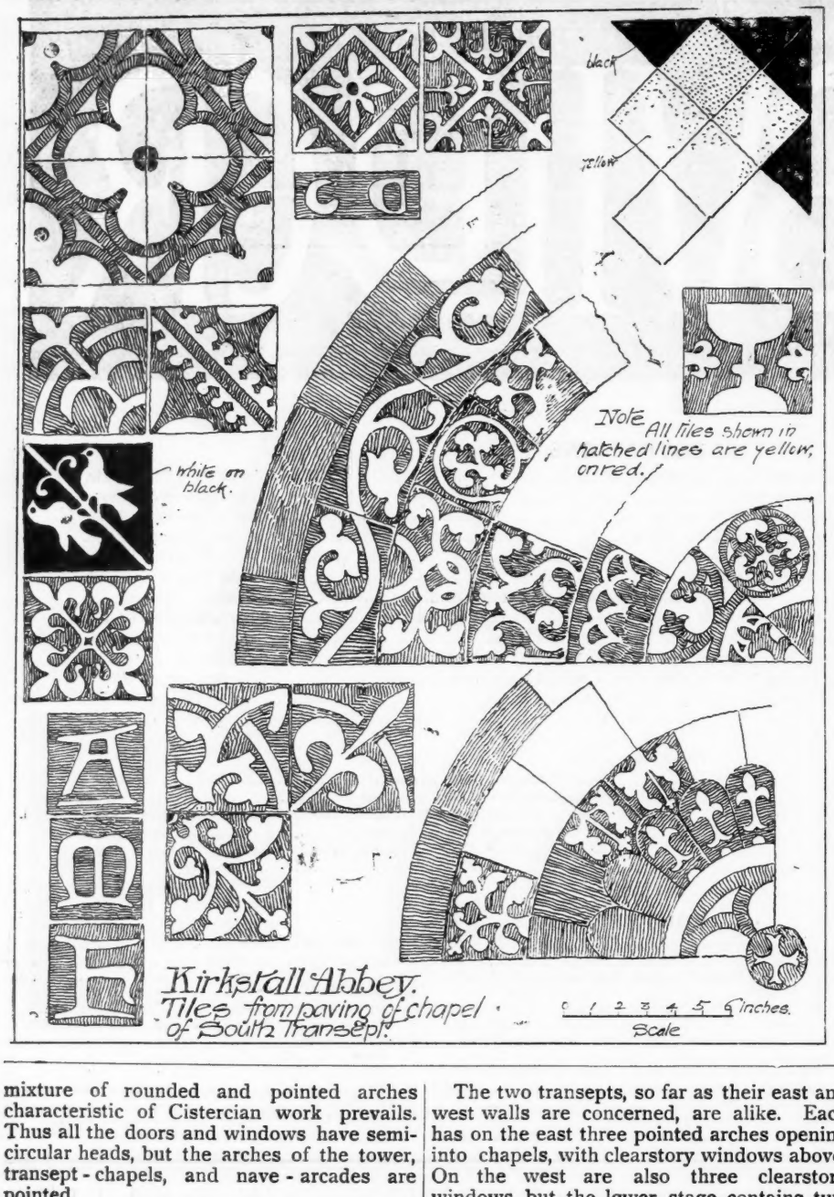
At the suppression of the Abbey the church was stripped of its roofs, glass, and fittings, but nothing else was destroyed; and the building remained quite whole until January, 1779, when, through the failure of the north-west pier, the west and north sides of the tower and part of the east side fell to the ground, crushing two bays of the north aisle in their fall.

As at Fountains, the architecture is marked by extreme plainness, but the beginning of the departure from stern Cistercian simplicity is seen in the introduction of carving and the somewhat elaborate doorways of the nave. Throughout the church the curious

* The series of the "Abbeys of Great Britain" is continued this month with illustrations of "Kirkstall." The next of the series (Abbey Dore) will appear in the number to be published on April 4, 1896. Particulars of the series will be found on p. 26.

* "In diebus illis erecta sunt edificia de Kirkestall ex lapide et lignis delatis. Ecclesia videlicet et utrumque dormitorium monachorum scilicet et conversorum, utrumque etiam refectorium, claustrum, et capitulum, et aliæ officinæ infra abbatiam necessariæ, et hæc omnia tegulis optime cooperta."—*Mon. Angl.*, v. 531.

† "Ipse manu sua ecclesiæ fundamenta jecit. Ipse totam ecclesiæ fabricam impensis propriis consummavit."—*Ibid.* v. 531.


black
yellow
Note All tiles shown in hatched lines are yellow, on red.
white on black.
Kirkstall Abbey.
Tiles from paving of chapel of South Transept.
0 1 2 3 4 5 6 inches.
Scale

mixture of rounded and pointed arches characteristic of Cistercian work prevails. Thus all the doors and windows have semi-circular heads, but the arches of the tower, transept-chapels, and nave-arcades are pointed.

The presbytery is divided into two stages by a string-course, upon which rest the shafts of the vault; this is of two bays and ribbed. The original east windows have been replaced by a large Perpendicular one of nine lights, now bereft of its tracery, but the first bay on each side has a plain Norman window. In the south wall are the usual drain, a wide recess for the sedilia (which were of wood), and to the west of them the Cistercian *ministerium* or credence for the high altar. The opposite wall is now quite plain, but there are marks of tombs or monuments having stood there that have subsequently been removed and the wall made good.

The original tower was supported by four lofty pointed arches of two orders, with scolloped capitals, but only in the north and south arches did the shafts rise from the floor, those of the east being partly, and of the west entirely corbelled off a little below the capitals, in the latter case so as not to interfere with the choir-stalls below. The tower was not vaulted, but ceiled over at some height above the arches, to afford a floor for the belfry stage. This stage, in accordance with the Cistercian rule, was a very low one, so much so indeed that at first it barely cleared the high-pitched roofs that abutted against it. For this reason the two round-headed windows in each side are placed widely apart, and have between them a doorway that opened into the roof. The windows have been subsequently divided by tracery into three cinquefoiled lights. The added story of the tower will be described presently.

The two transepts, so far as their east and west walls are concerned, are alike. Each has on the east three pointed arches opening into chapels, with clearstory windows above. On the west are also three clearstory windows, but the lower stage contains two windows only, the place of the third being filled by a pointed arch opening into the nave aisle. The north transept end has two tiers of three large windows, with a door below in the centre of the lowest stage. The gable contains a small and later traceried window. The south transept end resembles its fellow in the upper half, but the lower tier of windows is omitted, owing to the abutment of the monks' dorter on the other side. In the lowest stage are two doors, one towards the east on the ground-floor, opening from the transept into the vestry; the other towards the west, at a somewhat higher level, through which passed the broad flight of steps that gave access from the monks dorter to the church for use during the night offices. Of the original stair but few remains are left. The chapels east of the transept are divided from one another by walls, and each is covered with a pointed rubble-vault without ribs, springing from the side walls. In the south wall of each is the usual drain. The original east windows have been enlarged in later times.

The nave is of two stories, divided by a string-course. The lower is pierced on each side by eight plainly-moulded arches opening into the aisles, carried by massive clustered columns with scolloped capitals of various patterns. The eastern responds and the first five pairs of columns are all of one plan, being composed of eight semi-cylinders with much smaller ones between. The other two pairs and the western responds have fewer members, the sixteen alternating cylinders being replaced by twelve, more nearly of a size; the abacus of the capitals has also more mouldings. It is clear, therefore, that some slight pause was made in the building of the nave after three-fourths of it had been carried up to a certain height, for the pier arches and the clearstory above show no difference of design. The clearstory consists of a simple range of windows, rising from the string-course before mentioned; externally these have moulded heads and jamb shafts. The west end has a wide doorway in the lower stage, with two large Norman windows above. These have been subsequently filled with Perpendicular tracery of three lights, with a transom midway. In front of them is a gallery of communication between the two sides of the building. Above the windows is a depressed and four-centred straining arch, and over that a small Perpendicular two-light window in the reconstructed gable. The nave and transepts were not vaulted, but covered by wooden ceilings. The nave aisles have in each bay and at the west end an ordinary round-headed window, but in the third bay on each side this has been replaced by a Perpendicular one of three lights to light the retro-choir. Both aisles are vaulted with ribbed groins divided by broad transverse arches at each bay. There are no western doorways, but each aisle has a doorway in the last bay. On the north side this was an important entrance opposite to the abbey gatehouse. That on the south was the usual way by which the *conversi* or working brothers came into church. In the corner by this is a small door opening into a staircase to the roof. The south aisle has also another doorway in the first or easternmost bay, which was the usual means of communication between the church and the cloister.

Concerning the divisions of the church there can be no doubt, although nearly all traces have now gone, that the eastern part was reserved for the monks, and the western for the working brothers, the two sections being divided by the *pulpitum* and rood-screen at the second and third pair of piers. From the *pulpitum* the monks' choir extended eastwards into the crossing, nearly as far as the presbytery arch. The third bay of the nave formed the retro-choir, and from the rood-screen and its altar on the west the choir of the *conversi* extended down the fifth, sixth, and seventh bays. Both choirs were shut off from the aisles by stone walls, against which the stalls stood. In later times, as at Fountains, Rievaulx, and many other Cistercian abbeys, the *conversi* seem to have been replaced by hired servants, and their choir, with its enclosing walls, was then taken away and the nave thrown open west of the rood-loft. Advantage was taken later here as elsewhere to place altars and images against the piers.

Externally the church possesses many points of interest. Foremost among these is the way in which the tops of the four gable ends have been re-constructed. In each case this has been lowered and partly re-built in the fashion of the time, *i.e.* the fifteenth century, to accommodate itself to the new pitch of the roofs, which was simultaneously being altered. The angle of each gable is clasped by broad pilaster buttresses, divided into stages by string-courses and dying off just below the springing of the roofs; on these probably stood octagonal Norman pinnacles, but these have been replaced by square open-work turrets of three stories of little cinquefoiled lights, with gabled sides, and surmounted by a pinnacle. On the apex of each of the great gables was placed a pinnacle of similar design to the turrets, but of much smaller size and having only one cinquefoiled opening instead of two on each story of the sides. The pinnacle on the south gable overlooking the dorter once held a small bell. This gable seems to have undergone less alteration than the others, and retains an original pointed-oval window, in which, however, a later window has been intruded. All round the church the division of the bays is marked by broad pilaster

buttresses between the windows, round which are carried the several string-courses that mark the stages. The buttresses are stopped off by the parapets, which rested upon corbel tables running between them. From the clear indications of window-jambs that are formed in the aisle parapets, it is evident that above the vault of each aisle there was a low covered gallery or chamber of some kind. For what purpose this was built, or to what use it was put, is very uncertain.

The contrast between the two ends of the church is considerable. Both have the gables arranged in the same way, surmounted by like turrets and pinnacles, and flanked by similar clasping buttresses, but there the resemblance ceases. The east end is wholly filled by the great Perpendicular window. The west end has a rich and projecting porch-like Norman doorway, of four orders carried by jamb shafts, and surmounted by a gable enclosing an intersecting arcade of four arches. Above this, which fills the lower stage, is the pair of large Norman windows already noticed. They have richly moulded heads, carried by detached jamb-shafts, and with ornate hood-moulds. Portions of the inserted Perpendicular tracery remain in the heads. The north aisle door was once covered by a porch, which seems to have formed the termination of a pentise or gallery leading from the gatehouse, in the same way that the pentise at Canterbury connects the great gatehouse with the gate-house by the cellarer's hall. The doorway itself is of two orders, with rich chevron mouldings and jamb-shafts. Rising from the ground on each side and encircling this, is an exaggerated embattled moulding, spread out as it were on the wall, with somewhat curious effect.

The upper story of the tower, before the fall of 1779, must have formed a striking, if un-Cistercian, feature of the church. It was somewhat taller than the story below it, and had in each face a broad window of five lights with smaller lights in the head, which was depressed. Like the contemporary towers of Foumtains Abbey and the Grey-friars at Richmond, the tracery is uncusped. Above the window stage was another of only one-third its height, divided from it by a string-course and containing a small square window on each side. A stage corresponding to this exists above the belfry windows in the stately Fountains tower. The parapets, which have now entirely disappeared, were carried by a bold corbel-table. By slightly setting back the faces of this upper story from those of the old part of the tower room has been made for narrow buttresses at the angles. These were no doubt carried up through the parapet and ended in pinnacles.

From various details in the treatment of the original belfry stage of the tower, the enrichment of the west end, and the construction of the vaults, it is quite certain, even if we had not the evidence of the alteration in the plan of the piers, that the church was some time in hand. Of money, indeed, there seems in general to have been no lack, but it must not be forgotten that the monks were always anxious to begin to use the church at the earliest possible moment, and it is extremely likely that as soon as ever the presbytery and adjoining parts were high enough to carry a temporary roof they were occupied for the services. There would then be the less need to hurry on the work, and the parts furthest from the choir would be proceeded with more leisurely, the west end, the vaults and the tower being among the works that were left to the last.

With the ample funds they must have had at their disposal, the monks proceeded with the substitution of stone for the first wooden buildings concurrently with the church. Of the cloister itself, which covered an area about 115 ft. square, nothing whatever is left, save the traces of the roofs of its surrounding alleys against the three surviving walls. The fourth wall, that on the west, has been entirely removed. It shut off from the cloister, between it and the *cellarium*, a lane or passage, about 26 ft. wide, which seems to have been the cloister of the *conversi*. But there is reason to suppose that inasmuch as the *conversi*, as a part of the establishment, eventually disappeared, the wall between the two cloisters was then taken down, and the smaller area absorbed by a reconstruction of the monks' cloister. The buildings round the cloister follow the usual Cistercian arrangement. The eastern range was of two stories, and extended southwards from the transept for about 210 ft. The ground story exhibits, towards the cloister, a number of arches and doorways. The first of these is the doorway into a small square vaulted chamber, which was lined with shelves for books, and served at first as the library. Beside it, in the transept wall, is a large round-headed recess, where stood another bookcase of such books as were in constant use, and hence called the *armarium commune*. Behind the book-closet, and entered from the transept is the vestry, a small chamber with a pointed rubble vault and small window on the east. In the earliest days of the monastery it was quite large enough to hold the few necessary ornaments for the altars and ministers that were permitted in a Cistercian house. The next apartment is the chapter-house. This is entered from the cloister by two large moulded archways, placed side by side, and flanked by two small window-openings, beyond each of which is a recess to match. It was originally about 50 ft. long and 30 ft. wide, and of three bays, vaulted in six compartments, resting on the side walls, and two central pillars. In the thirteenth century the easternmost bay was taken down and rebuilt, but to twice its former length, and the whole large square bay thus formed is covered with a ribbed vault of three divisions and one span. The new bay was lighted by two windows in the east wall, and one on each side immediately adjoining. The most curious thing is, however, that the new walls are almost entirely built of stone coffins, which are complete, even to their lids! The explanation is nevertheless a simple one: viz. that the extension is built upon part of the monks' cemetery, which lay all round the east and south-east parts of the church, and the wall is built of the coffins which were disturbed in excavating for the foundations. Some of them have been "tapped" for the treasures that were supposed to be within, but a few remain intact. Next to the chapter-house is the *auditorium* or parlour, where conversation was permitted instead of in the cloister. It retains its vault, and is entered from the cloister. A door at the other end once led to the cemetery, but in later times to a room built outside it. The next doorway southward at one time opened on to a broad flight of steps leading to the upper story, which was the monks' dorter. Under them was a small closet lighted by a narrow window on the east, and entered by a doorway on the south from the next apartment, which is a vaulted passage of communication between the cloister and the infirmary. A door in the south wall of this passage opened into a fine and spacious sub-vault, originally of five bays, with a central row of columns to carry the vault. This was formed in ten compartments, divided by transverse arches from pier to pier and pier to wall. The pillars are each formed of a single stone, like those in the crypt at Canterbury and the chapter-house at Jervaulx, with scolloped capitals. The three southernmost bays were walled off from the other two, so as to form a separate apartment, which was provided with a large fireplace in the east wall. Until 1825, the whole was in fairly good preservation, but in that year the sudden collapse of the vault converted it into a ruin. The use to which this part of a Cistercian abbey was put is doubtful. By a process of elimination it seems at first to have been the novices' department, but in later times it may have served different purposes, as shown by the sub-division of it. Next to it, southwards, is a broad passage covered by a plain barrel vault, and having in its south wall two privies. The shafts of these open into the space on the other side of the wall, which served as the pit of the monks' reredorter on the floor above. The pit is practically an open section of the great drain of the abbey, which here runs through the buildings, and has a paved bottom, and battering sides. The range terminates beyond this with another but narrow passage.

The upper story of this range of buildings formed the *dormitorium* or dorter of the monks. At its north end, where it abutted against the transept, was the stair of communication with the church. This had a landing just inside the door, to the west of which was the treasury, a small vaulted chamber over the cloister book-closet. This end in later times probably served as a vestry. The dorter itself extended over the chapter-house and as far south as the thick wall that separates the old novices' department from the arrangements beyond. Upon this thick wall no doubt stood another which formed a division between the dorter proper and the reredorter that occupied the rest of the range. Besides the night-stairs the dorter was reached by another stair from the cloister. This, at first, was placed next to the parlour, but a new one was afterwards made on the west side between the dorter and the warming-house. The dorter itself is so ruined that little can be said about its architecture. It was divided into bays or cubicles, and lighted on each side by a row of small windows, one to each bay. On the west side some of these remain. Each is pierced in the back of a wide round-headed panel, rising from the string-course under which the roof of the cloister-alleys abutted. The dorter roof was originally of such high pitch as to cover the central window of the transept end and cut across the others, but it was subsequently reduced to one nearly flat, as may be seen by the lead-lines on the church wall.

Attached to and extending eastwards from the south end of the dorter range are the tolerably perfect remains of a building of unusual interest. By the Cistercian *Consuetudines* abbots were enjoined *in dormitorio jacere, in hospitio comedere*. But before the close of the twelth century they began to appropriate a set of chambers, or even to build for themselves a separate house. The latter proceeding was a flagrant violation of the rule of the Order, but it was often done, and Kirkstall furnishes us with an excellent example in the building under notice. By attaching it to the dorter, so that nominally it formed part of it, a desperate effort was made to comply with the injunction as to where the abbot should sleep, but practically it is a separate building, and a most interesting example of a private dwelling-house of the end of the twelfth century.

It is divided by a broad flight of steps into two parts. The westernmost is three stories high, and consists of a cellar, or servants' department, on the ground floor, with the abbot's solar or living-room over, and his bedroom on the floor above. Both rooms are furnished with fireplaces, and lighted on each side by two large windows, of two pointed lights divided by a shaft and enclosed by a round-headed arch. Each room also had a sort of entrance-lobby or ante-room, lighted at either end by a small square-headed window; and at the west end was a garderobe. The easternmost part was of two stories only. On the ground floor were two vaulted apartments occupied by the kitchen and its offices, to which were attached some other rooms outside on the north. The upper floor was entirely occupied by the chapel. This end is unfortunately almost wholly ruined and only the gables are standing. The one staircase gives access to all the upper parts of the abbot's house. It was approached from the north by a covered passage or gallery, which runs northward and joins another gallery that led from the cloister to

a large group of buildings on the east. This group is connected with the abbot's house by a series of chambers joining on to the corner of the chapel, and collectively formed the monks' *infirmitorium*, or infirmary. This was not only the place for such as were sick, but as its name implies it was the abode of the infirm. Here, too, temporarily lived those who had been blooded and such as could obtain relaxation from the strict rule of the Order.

The Kirkstall infirmary, like that at Fountains, is so much ruined that the walls are reduced to but a few feet in height. It is, nevertheless, possible to make out a good deal concerning its arrangements. At first it consisted of a large hall, 83 ft. long and 45 ft. wide, and of four bays, divided probably by wooden pillars carrying the roof into a nave and aisles. In the latter were placed the beds or cubicles of the inmates, and the nave formed their living-room. In the fourteenth century the wooden pillars were replaced by a stone arcade of five bays, and still later the arches were closed by walls, and the aisles cut up into a number of small living-rooms, each with its own fireplace, with bedchambers above. The latter were reached by a stair on the south-side of the nave, and there was also an external stair against the west wall, under which was a store-place for coal and fuel. The large room filling the south-east corner of the hall has been widened southwards, perhaps to form a chapel. The range of buildings between the hall and the abbot's house was of two stories; in the lower were various offices of doubtful use, but the upper seems to have formed an appendage to the abbot's house, probably for the accommodation of the father-abbot at his periodical visits. It was reached from the abbot's chapel by a projecting lobby on the west, and consisted of three chambers, the central of which clearly had a large oriel window on the east. To the north of the infirmary hall is the kitchen and its yard.

The passage or gallery connecting the infirmary with the cloister had, like that at Fountains, an upper floor, which was reached by a small winding stair at the west end. The upper story probably formed the library. It had a fireplace on the north side, and, apparently an extension northward, also with a fireplace, over a building in that direction.

It will be noticed that both the infirmary and the abbot's house are deflected southwards, perhaps to avoid encroachment of the former upon the monks' cemetery.

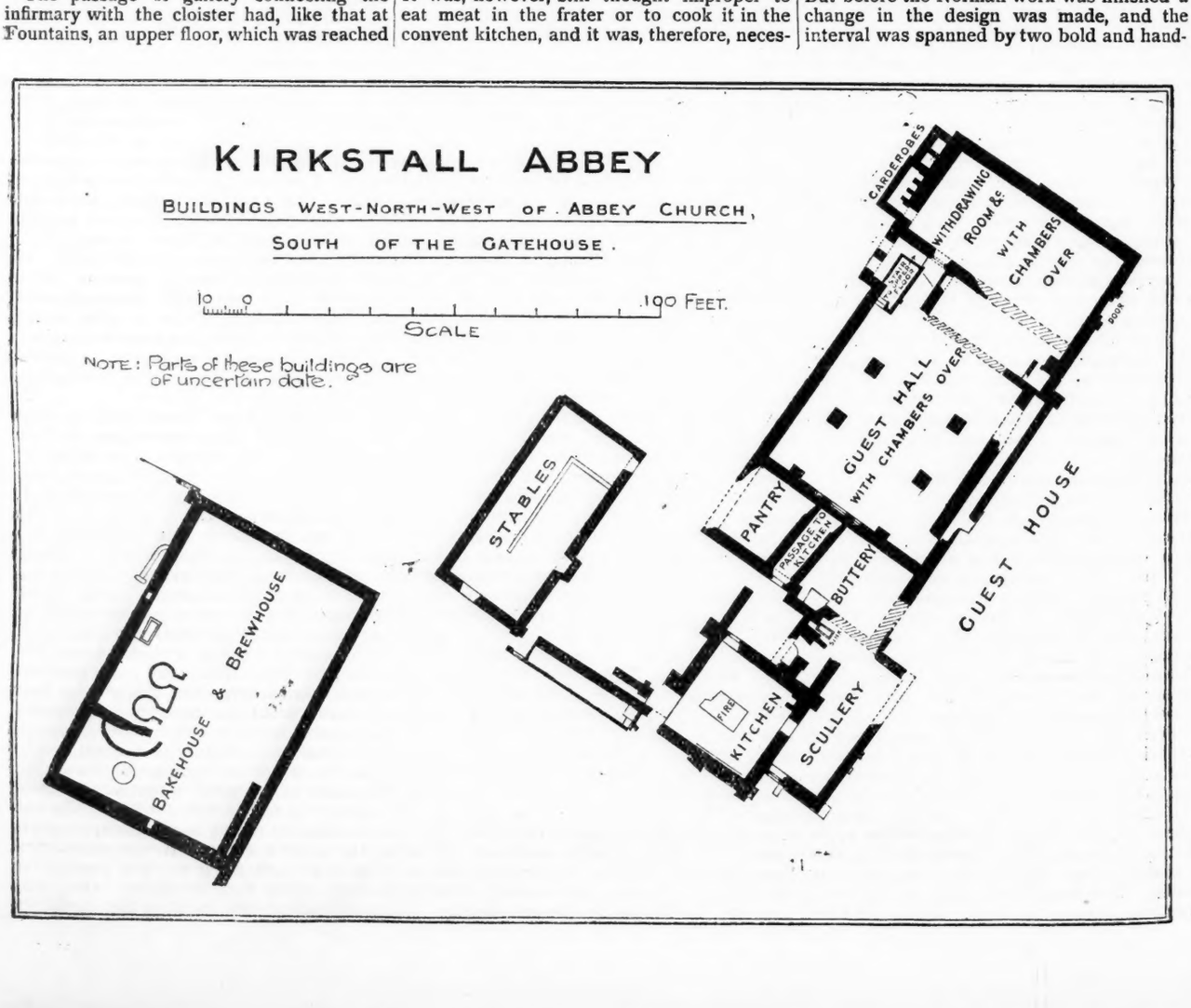
The buildings on the south side of the cloister are much ruined, but fortunately not to such an extent as to prevent their uses and arrangements from being made out.

The first building next the dorter is the *calefactorium*, or warming-house, where the monks could come and warm themselves in winter. It was entered, as usual, from the cloister, and has the hearth of a huge fireplace on the west side. On the east of it is the later staircase to the dorter, with a branch stair off it into the warming-house. Under the stair is a storeplace, and in front of it part of the warming-house seems to have been partitioned off for some purpose, perhaps as a coal-cellar. The warming-house was lighted by windows on the north and south sides. Besides its entrance-door, there were two other doorways in the west wall opening into the old frater, and at least another into the yard to the south. Against its south wall was a broad pentise that formed a passage from the frater to the dorter sub-vault.

The *refectorium* or frater was originally a large and lofty hall, 97 ft. long and 31 ft. wide, of late Norman date, standing north and south in the usual Cistercian manner. It was entered from the cloister and had a serving-hatch from the kitchen in the west wall near its north end. Further south in the same wall was the reader's pulpit. In the early days of the Cistercian Order not only was the use of flesh-meat absolutely forbidden, but even the use of grease or fat to cook the vegetables. But in later times the rule was partly relaxed, and finally meat might be eaten on three days in the week. It was, however, still thought improper to eat meat in the frater or to cook it in the convent kitchen, and it was, therefore, necessary to find other places for the purpose. At Fountains a special hall or "misericord," as it was called, was built in connexion with the infirmary-kitchen, but at Kirkstall a different arrangement was made. This consisted in dividing the frater by a floor into two stories, which were lighted by new three-light Perpendicular windows. Each story was also furnished with a fireplace, made in the projection formerly filled by the pulpit. The upper floor was then used as the frater proper, access being gained by a staircase leading up from a new door in the cloister; while the lower floor became the misericord. The west end of both rooms seems to have been shut off to form an ante-room of some kind. The old kitchen continued to serve the frater, so a new kitchen to serve the misericord was built at its south-east corner, where its ruins may still be seen. Very few traces of this interesting and curious conversion now remain, owing to the ruined state of the buildings, but such as there are plainly tell the tale.

West of the frater is the *coquina*, or kitchen, a good deal of which is left. It has, unfortunately, lost its vault, and the east and west walls are much ruined; but it is clear that the fireplace, or fireplaces, stood in the middle of the room, as at Fountains. This explains the somewhat unusual grouping, in pairs, of the four windows in the south wall. Externally these are also irregularly set in large panels, formed by arching over the intervals between the pilaster buttresses. From the fact that the kitchen has two doorways from the cloister, it is probable that the west end of it was partitioned off for a pantry, or some other office. In the north-west corner of this is the base of a large oven of doubtful date. Outside the kitchen ran a pentise beneath the windows, which was returned southwards and carried along the frater wall.

The space west of the kitchen was originally intended to be open, in continuation of the lane or cloister of the *conversi*. But before the Norman work was finished a change in the design was made, and the interval was spanned by two bold and hand-



some semi-circular arches, so as to carry a floor over the space. As this floor was entered from the *cellarium* on the west, its building probably indicated an unexpected increase in the number of the *conversi*. That it was an afterthought is clearly proved by the row of hooked corbels for a projected pentise along the *cellarium* wall, which could not be used in consequence. The northern of the two arches is still closed by a fifteenth-century blocking, wherein is a door. If the southern arch has been so blocked the wall has been entirely removed. Just outside it is a huge circular kneading-trough (?) 12 ft. in diameter.

Of the great building called the *cellarium* (because it was in the charge of the cellarer), that formed the west boundary of the cloister only the north end and east side are left. It was eleven bays long, with a central row of columns to carry the vault. Like the rest of the buildings, it is of Norman date. The northernmost bay was cut off from the rest to form the outer parlour, and besides a doorway from the cloister it had another in its north wall. The sixth bay was also walled off from those on each side of it as the entry to the cloister from without. The bays north of this were no doubt used as cellars, but those to the south formed the frater of the working brothers. It still retains the hatch from the convent kitchen, which served it, in the bay that formed "the screens." The whole of the upper floor was the dorter of the *conversi*. It was probably reached by a porch and stair on the west, as at Fountains, all traces of which are gone. It also had a stair on the east descending from an existing doorway with a curiously joggled lintel, beside which is a lampshead, into the lane or cloister between it and the monks' cloister. This stair was covered by a pentise, and enabled the *conversi* to have direct access to the church for such night services as they were bound to attend. Extending westwards from the south end of the *cellarium* is the perfect shell of a two-storied building, through which passes the main drain. In the lower stage the side walls were pierced by wide arches, but the upper floor formed the reredorter of the *conversi*, from whose dorter it was entered, and had down its centre a double row of privies placed back to back over the stream that ran through the drain. It was lighted and ventilated by small loops, of which there were two on each side, and five at the west end. Two other loops in the west wall lighted the basement.

Of the buildings in the outer court there are some interesting remains to the west of the church. The principal of these are the foundations of a large guest-house, consisting of a hall and great chamber, both raised on undercrofts, with buttery and pantry, and kitchen and offices. The only part standing to any height is at the north-west corner; it retains part of the stair to the upper floor and the pits of the garderobes of the chambers. West of the kitchen are the foundations of a large oblong building, perhaps the stables, and south of them the like traces of a still larger structure retaining the hearths of several ovens, &c. which was probably the bakehouse and brewhouse. A separate plan of these detached buildings is subjoined.

Some remains of the gatehouse exist in the modern house on the north side of the road that now runs through the Abbey precinct.

In 1888 the ruins of the Abbey and the adjoining grounds, which had been in private hands since the suppression, were bought by Colonel North and presented by him to the City of Leeds to be used for public purposes. At the suggestion of the local archæologists Mr. St. John Hope was requested to advise the Corporation as to the proper treatment of these important remains, and in January, 1890, presented to them a full report. In this were fully discussed the methods suggested for the proper repair and preservation of the ruins, and it is hardly necessary to say that any attempt at "restoration" was particularly deprecated. It was further pointed out how greatly the ruins were being injured or in danger of destruction by the luxuriant growth of ivy and small bushes, and the presence of large elm trees, which had been suffered to grow up in and about the abbot's house, the kitchen, the frater, and other buildings of which important remains were standing. The recommendation to completely remove these root and branch was forthwith carried into effect, the taking down of the lofty trees being done with most commendable care. The result from the picturesque point of view is, of course, much to be deplored, but the eventual gain through the loss of such potent agents of destruction must appeal to ordinary common sense. At the same time a large number of "unemployed" labourers were set to work to remove the fallen stones and rubbish that had accumulated in and about the abbey, so bringing to light many interesting remains and foundations of destroyed buildings. The next work was that of conservation and repair, and this, by Mr. Hope's advice, has been entrusted to Mr. J. T. Micklethwaite, F.S.A., whose knowledge of monastic remains, as well as his reputation as an architect, pointed him out as the best man for the work. Under the supervision of another well-known antiquary, Mr. J. T. Irvine, as clerk of the works, the reparation of the abbey has now been almost completed. Opinions may differ as to the treatment of certain parts; but there can be no doubt that the most careful means have been adopted not only to keep all that has come down to us, but to prevent, as far as possible, further ruin, through the destructive agency of wet and frost, or the growth of trees on the tops of the walls and vaults. The practical completion of the work was marked by a formal ceremonial "opening" in September, 1895.

THE STATE OF THE WEST FRONT OF PETERBOROUGH.

IT is now some time since an appeal was made by the Dean of Peterborough for public subscriptions towards putting the great arches of the western façade of the cathedral in a state of security. We drew attention at the time to the importance of the subject, observing that it was one not of local but of national, it might even be said of world-wide interest. The façade of Peterborough is a thing unique in architecture; it is one of the grandest achievements of Mediæval builders; its loss would be irreparable, and it is with nothing less than its loss, at no very distant date, that we are threatened, unless adequate means are taken to preserve it. At the same time we are of opinion that before any large response to the appeal for help can be expected to be made, the public ought to have a full statement, not only as to the present condition of this portion of the fabric, but as to what it is proposed to do with it. Even those who are sufficiently impressed with the importance of the subject cannot be expected to subscribe blindly, without knowing what is required or what is going to be done.

It is exceedingly unsatisfactory that we should have had to wait in vain, so far, for any authoritative report based on a full examination of the fabric, or any statement as to the proposed method of dealing with it. The matter is understood to be in the hands of Mr. Pearson, as architect, but no report has been forthcoming, and we may take it that none has been prepared, as no complete scaffolding has been erected such as would admit of a full examination of the state of the work. Surely this ought to be seen to, and a report published, without further delay.

Some information we are able to give as to the present condition of the front. In regard to the foundations of the great piers, there seems reason to believe (contrary to what would be generally expected) that no serious amount of underpinning would be required except to the south-western pier, the one on the right to a spectator looking towards the front, though a further and more detailed examination of the foundations may modify this view. The north-west corner of the front, and the north-west pier, have been thrust out of the perpendicular by the weight of the tower at that point. This tower is simply built on the upper surface of the vaulting between the great arcade and the main west wall of the nave, so that the vaulting necessarily develops a strong outward thrust against this pier, which is reported to be no less than 2 ft. 2 in. out of the perpendicular. The two central piers have also been pushed forward to a considerable extent; and the groins of the vaulting in the north and central bays are much crushed, the ribs have split, and the rib mouldings at the haunches have been broken off by the thrust. The different orders of the arches have dropped generally. The gables over the arches are also in bad repair; some of the marble shafts (which came not from Purbeck but from the quarry of Aldwinckle near Peterborough) in the rose window and arcading, are in two pieces, and the lower halves are generally split and broken away through the deterioration of the iron dowells, which run right up the lower half of the shafts, from the base to the upper half. The statues are quite loose, and these and the large gargoyles are merely supported by irons much rusted away. On the other hand, the stones themselves of the arches and piers are in excellent preservation, even the dog-tooth and other ornaments in the arches being almost as sharp and as good as when they were cut. This is an important point, because it shows that the failure is that of the construction and not of the material.

The front was pointed in 1736 and again in 1802, but this could only of course have the effect of making things look better and of keeping weather out of the joints. In other respects the structure has scarcely had anything that can be properly called repair for 600 years, though it was evidently recognised at a comparatively early date that it was in a weakly condition, as there can be no doubt that the fifteenth century porch in the central arch was built mainly in order to give some support to the central piers, which indeed could be the only possible justification for it, for there is no doubt that architecturally it is an injury to the majestic completeness of the original design, being entirely out of scale and out of character with it.

There can be no question that whatever is done must be done thoroughly, and that no operation will be satisfactory which does not permanently stop the tendency to outward movement of the front. The difficulty is to achieve this without injuring the work architecturally. As far as we are aware, the means which have hitherto been proposed to effect this would be quite inadequate. Nothing seems to have been suggested up to now except tying the front into the rear structure, and it is a question whether there is sufficient mass in the nave walls to form an efficient anchorage for such a massive structure as the façade, and whether the façade would not in that case, if it settled any more, pull the nave arcade and vault out with it. A complete and efficient underpinning would prevent the foundations from giving any further, but, in the case of the north-west compartment at all events, there still remains the weight of the tower, which might move the upper portion of the pier and arch further out even if the foundation were rendered solid, which would result of course in cracking the pier. In fact, we may conclude that it is partly owing to the original foundations being of an inadequate and yielding character that the work has kept so well together as it has; it has gone over bodily, instead of cracking. It would be possible to get rid of the thrust from the weight of the north-west tower by ties, though

the tower would have to be taken down first to ensure the thing being thoroughly done; but after the successful taking down and re-erection of the central tower no difficulty need be anticipated about that.

The mention of this point leads one to notice the possibility, which must be faced, that no way of making the work perfectly stable could be found without taking down the façade and rebuilding with the same stones, but on a proper foundation and with a better system of bonding. One almost dreads even to suggest such a thing, for fear of the opening that would be made for playing "restorative" tricks with the work in rebuilding. At the same time there is the fact that the facing stones are mostly in good condition and they could be numbered and reset, and that with proper care the front might remain in all essentials the old front set up again. To attempt to push the work into position by hydraulic jacks, as was done with the south wall of St. Albans, is not to be thought of; the mass is too great to be handled in that way,* and even if the power could be applied, the first result of it would probably be to crush and bring down all the vaulting between the front and the west wall of the nave. The matter seems to rest between extensive underpinning combined with ties up above, or the radical cure of rebuilding. If only the latter operation were carried out as an honest piece of rebuilding—taking down the old stones and putting them together again, with no "restoration" frolics except the mere putting in of a new stone here and there in place of a decayed one, we are inclined to believe that no other process would be so satisfactory in the end, or give so long a new lease of life to the grand façade. Of course when we speak of numbering and replacing the stones, we mean only the exterior ones which constitute the architecture; it would no doubt be found that the interior of the piers would require a great amount of new and better bonded material, and it is exceedingly probable that when we once found out how the interior of those large piers has been put together, we should discover, as in the case of the crossing-piers, that their construction went a considerable way towards an explanation of their tendency to failure.

Whatever is done, we think it highly important that an engineer should be associated with the architect, as adviser in regard to the practical or mechanical portion of the work. The case is such an exceptional one, and the mass and weight of material to be dealt with so unusual, that it would be most desirable to have the advice of a professional man whose technical training and experience have lain especially in dealing with great works of construction and with great masses of material. With such a man as technical adviser, with Mr. Pearson to look after the architectural preservation of the work (and though we cannot approve all that Mr. Pearson has done in restoration, we consider his treatment of the crossing-piers and the tower at Peterborough entirely unassailable), and with such a clerk of works as Mr. Irvine, who knows more of Mediæval work than any other possible clerk of works in England, it is to be hoped that the repair, whatever method may be employed, would be satisfactorily carried through. But it will require a great deal of money, and money will not be forthcoming until the intelligent portion of the public are in possession of fuller information. A full examination and report by the architect ought to have been made and published before now: why is it not done, and what are the Cathedral authorities waiting for?

OLD MAR CASTLE, DEESIDE.—The contracts for the restoration of Old Mar Castle have now been accepted by Mr. A. Marshall Mackenzie, A.R.S.A. Most of the work has been given to local employers.

* The operation at St. Albans, we may observe, was not by any means so well carried out or so successful as people were led to suppose. It was carried out far too hastily, and the walls and piers were very much knocked about.

NOTES.

A "SPANISH EXHIBITION" containing copies (merely) of two of the most celebrated works of Velasquez, the "Surrender of Breda" and the "Drinkers," is not a kind of picture-show to be very jubilant over. Of all painters Velasquez is one of the most impossible to represent in copies, the very life of his paintings consisting as much in the master's powerful and inimitable style of handling as in the subject and composition. Of minor works by Velasquez there are some interesting and genuine examples. Of these the finest of all is the painter's broad and powerfully painted portrait of himself (140), lent by Sir Francis Cook. The interesting but not very great series of illustrations of the story of the Prodigal Son, formerly seen in one of the Burlington House Loan Exhibitions, is also at the New Gallery. Sir Charles Robinson's "Jael and Sisera" (12), a remarkable work both in its force of colour and its curiously naïve presentation of the personages and armour and the surroundings of the painter's own time, is no doubt in part by Velasquez, though it hardly seems as if all the figures were by the same hand. After looking through the collection of ancient pictures or copies of pictures in the west and north galleries, one carries away an impression of having seen a great deal of dull and depressing colour and conventional treatment and lighting, and there is really a relief in going from these to the few modern pictures in the south gallery. One does not want, it is true, to see any more of a painter so *clinquant* in style as Madrazo, but several examples of Fortuny's free and powerful and utterly unconventional work make the majority of the old works exhibited in the other galleries seem very dull in comparison. A brilliant piece of architectural painting, "View in Toledo," by Escosura, and a masterly portrait of "A Chorister," by Goya, are among the prominent works in the modern collection. The exhibits of decorative work and textiles may claim a word to themselves on another occasion.

THE statues of Demeter and Hecate, recently discovered by Dr. Dörpfeld, in the course of his excavations on the west slope of the Acropolis, are said to be of brass, but that may be a misprint for bronze. Be that as it may, the Demeter statue, whatever its value as a work of art, will probably prove to be of great topographical importance. In our detailed notice of the excavations, we mentioned that Dr. Dörpfeld was searching for the Eleusinion which Pausanias saw, and in which were temples to Demeter and Kore. We also noted that, as the rock crops up very near the surface at this point, there was some fear that all traces of the ancient sanctuary might have disappeared. This Demeter statue, probably a votive offering, revives hope. The topographical importance of the Eleusinion can scarcely be over-estimated for with it goes the whole question of the Enneakrounos episode, which has been more than once referred to in our columns.

FROM Athens we also learn that the work going on at the Panathenaic stadium, in preparation for the Olympic games to be held in the spring, has yielded results of some archæological importance. A marble head has been found which seems to have formed part of a double Herm, like that found many years ago on the same site, and now in the National Museum at Athens. It has also been established that the sides of the stadium are not in a straight line, but describe a slight curve. At a point about the height of the twenty-sixth step a portion of the *διάζωμα* has been discovered. Every effort will be made to restore the stadium as far as possible as it stood in antiquity.

THE Municipal Council of Paris, on the proposition of one of its members, M. Grébauval, has resolved to undertake, at the municipal cost, the care of all the neglected or abandoned tombs in the Paris cemeteries which have any special interest of a historic, artistic, or national character; of which there are very many. We may mention especially, in Père Lachaise Cemetery, the tomb of Heloïse and Abelard, that of Molière, those of La Fontaine, Méhul, Grêtry, Lakanal, the Duc d'Abrantes, and Claude Bernard. At the Mont Parnasse Cemetery is the tomb of Hégésippe Moreau, the poet, and the celebrated tomb of the four sergeants of Rochelle. In the Montmartre Cemetery is the tomb ot the painter Greuze, which possesses both artistic and historic interest. As the preservation of all these monuments would impose a considerable expense on the Municipality, the Council have asked the Department of Fine Arts to participate in the conservation of sepulchres containing the remains of *savants* and artists who had contributed to the scientific and artistic reputation of France. One may congratulate the Municipal Council on having for once undertaken an important piece of work on grounds purely artistic and national, and without any political *arrière pensée*, a fact sufficiently rare to be worth notice. Possibly this example on the part of the Paris Municipality may furnish a hint or an example to the French Government to give more attention to the preservation of remains that are connected with the national history and national reputation.

THE coming twenty-fifth anniversary of the amalgamation of the German Architectural and Civil Engineering Societies will be made the occasion for a special exhibition of German architectural design at the International Art Exhibition at Berlin. Sufficient space has been put at the disposal of the permanent council of the amalgamated societies, and the council proposes that the exhibition shall include illustrations of the best works of the last twenty-five years, and that the fact of a drawing having been hung on an earlier occasion will not exclude it. Models, drawings and photographs will be allowed, but perspectives will be preferred, the circular pointing out that, to make the exhibition a success, it will be necessary for the exhibits to be easily understood by the general public. Special invitations will be issued asking architects to send illustrations of certain works recognised by the council as important examples of German design, and such an invitation can scarcely be refused, as it will be considered a distinction. These special invitations will, of course, in no way preclude any architects who are not invited from sending in whatever they like to be put before the hanging committee in the ordinary way; it is simply the intention of the council to use all their influence to have thoroughly representative work, and to prevent the Architectural Room being such a farce as it generally is at Berlin. The sending-in day is February 15. Foreign architects will exhibit their work independently of the German section, but different countries are free to form separate groups of their own architecture, in the same way as with the paintings.

WE fear that the fresh agitation for the preservation of the Rolls Chapel is too late to be of any avail. The Office of Works are busy with the "wrecking" of both the Rolls House and the Chapel, which stand behind the north wing of Block I of the new Record Office buildings, Chancery-lane. The Rolls House, south of the site of Symond's Inn, was built (1718) after the designs of Colin Campbell, whose account for the work is preserved.* It is of brick, with stone

* See his "Vitruvius Britannicus," vol. iii., and our "Note" of May 4, 1895. Allen's "History of London" says that nine of the houses lately pulled down in Rolls-yard were built, in 1719, by Sir Joseph Jekyll, Master of the Rolls, after Campbell's design, at a cost of from 5,000*l.* to 6,000*l.*

dressings, and has four stories, counting the basement. The house has a fair garden, and formed the residence of the Masters of the Rolls to Copley's time; until August, 1881, it served as the Master of the Rolls's Court, and was then taken for uses of the Public Records. The Chapel is unroofed, and stripped of all woodwork, most of the attic walling is pulled down, the tracery and coloured glass is knocked out of the windows. There is some talk, however, of retaining portions of the fabric, and incorporating the south wall in the next block of the new buildings, to join Pennethorne's block, eastwards. That south wall contains the fourteenth-century window discovered on the demolition in 1889 of a modern house, which also blocked in all but the upper portion of the square stair-turret, or tower, projecting from the east end of the wall. The latter corresponds with the tower, carrying a high conical roof, shown in a drawing of the chapel on a margin of the Corpus Christi College, Cambridge, MS. of Matthew Paris's Chronicle. The turret (see our view of May 27, 1893) has an outer door, and in its west wall is a high slit-window that lights the newel staircase leading up to the floor above the groined ceiling of the chapel. The original chapel of Henry III.'s *Domus Conversorum* was rebuilt by William de Birstall, appointed Keeper in July, 1371. Pennant writes:—

"The chapel is adjacent to the house, and was built by Inigo Jones; begun in 1617, and finished at the expence of two thousand pounds."

There is a view of the chapel in B. Cole's "London Restored on Sir J. Evelyn's plan for re-building that antient Metropolis after the Fire in 1666." It seems that the flint-work which forms much of the outer casing of the rubble stone-work was added in or about 1784.*

AMONG the monuments in the Rolls Chapel, standing against the north wall, and now boarded over, is that of Dr. John Yonge, Master of the Rolls from 1510 until his death, seven years later. This beautiful and early example in England of Renaissance art is ascribed by Vertue and Walpole to Torreggiano. It is of terra-cotta, coloured; the effigy, wearing a long red gown and high cap, rests on a sarcophagus—the face is finely modelled. In the recess is a head of Christ, between two angels, in high relief. Here, too, are monuments to Sir Richard Allington, *obiit* 1561, and Edward, Lord Bruce of Kinloss, Master of the Rolls, who died in 1610. Lord Bruce (ancestor of the Earls of Elgin, and Marquesses of Ailesbury), lies reclined, resting his head on one hand; his long beard is forked, he wears a long furred robe. The kneeling figure, in armour, is supposed to be that of his son, second baron, slain in a duel by Sir Edward Sackville, afterwards Earl of Dorset, in 1613. Sir Richard Allington married Jane, sister of Sir William Cordall, Master of the Rolls. He is in armour, kneeling opposite his wife; below are their three daughters. In the west window were the arms of Sir Harbottle Grimstone and Sir Robert Cecil. Sir John Trevor, after his expulsion from the Commons, continued to occupy the older Rolls House, and died there in 1717.

THE private Bill which will be introduced into Parliament by the Trustees of the Dysart Estate, who are the owners of Ham House, Ham Common, Petersham Common, and, in fact, the land between Richmond and Kingston, will require careful watching in the public interest. The object of this Bill is to extinguish certain public rights in exchange for some public advantages. But it appears as if the public are likely to have the worst of the bargain. Thus, Petersham Meadow, over which a number of public footpaths run, and which is a low-lying piece of land, unsuitable for building-sites, is to be transferred to the Corporation of Richmond as an open space. On the other hand, Ham Fields, which are very extensive commonland, some two hundred acres in extent, are to become absolute private property, the common-right being extinguished. But the public right of way and the situation of Petersham Meadow practically cause it now to be an open space, which cannot be used for building purposes, so that the exchange is all in favour of the trustees. That a fair arrangement, advantageous both to the public and to this particular estate, may be made can hardly be doubted, but clearly a large part of Ham Fields should be dedicated to the use of the public as an open space, if the common-rights are to be extinguished. There must be a fair exchange of rights or none at all.

THE fatal accident near Acton on a level-crossing, by which an able writer has lost his life, calls public attention again to the impropriety of level-crossings on railways in residential neighbourhoods. It was stated at the inquest that the number of persons who used the crossing was small, but level-crossings should not be permitted except in purely rural districts. It is well known that the Board of Trade have no statutory power to oblige railway companies to put bridges in place of level-crossings, except in the case of new lines. This power should be given to this Department by Parliament. A lame or a blind man is as much entitled to the use of a highway as any other member of the community, and everyone not gifted with the keenest of sight or hearing, runs a risk at a level-crossing. A railway company will never carry out all its duties unless under legal compulsion, and as the change of level-crossings into bridges or subways causes unremunerative expenditure, railway companies are always desirous of avoiding such work.

THE annual Report of the London School Board to March 25 last, which has been recently published, contains some interesting statistics from the Works Committee of this body in regard to the constructive business of the Board. The first point to be noticed is that the expenditure during last year on sites, schools, and furniture was, in round numbers, 509,000*l.*, as against 488,000*l.* during the previous year, and this amount was paid out of loans. This is not a pleasing fact for the coming generation, for there can be no doubt that the demand for accommodation will increase, and at the same time the indebtedness of the Board also increases. Again, no less a sum than 204,171*l.* was spent in enlargements of existing schools: this alone represents a very large amount paid away in wages to manual labourers. In addition, however, to this work the Board had in hand the erection of cookery centres, schools of special instruction, centres for instruction of deaf and blind children, housewifery centres, and also a good deal of work in connexion with apparatus for warming schools. While there is this great and no doubt necessary expenditure running on, the taxpayer will be gratified to learn that though the Board paid 82,000*l.* for sites, the surveyors' fees in connexion with these transactions only amounted to the modest sum of 980*l.*

IT is worth note that Tobin bronze plates ¼ in. thick were used in the construction of the hull of the cup defender *Vigilant*, owing to their lightness, strength, and resistance to the corrosive action of sea-water. This metal when rolled hot is remarkable for its high elastic limit and tensile strength, test pieces cut from ¼ in. and $\frac{3}{16}$ in. plates having an average strength of 35 tons per square inch, and an elastic limit of no less than 23 tons per square inch; figures which compare most favourably with the best quality of mild steel.

THE Committee of the Health Section of the Cardiff Exhibition, which is composed of the Local Borough and County Medical Officers of Health, Municipal Engineers, two Cardiff architects (Mr. Caple and Mr. Seward), and several local plumbers, is making special efforts to ensure the success of this section, which bids fair to be a very important and interesting one. It is intended to show exhibits of all matters affecting health, both from a private and public standpoint. They will be classified in three divisions, with subdivisions as follows:—

No. I., comprising science in relation to health, subdivided into (1) Bacteriology; (2) Demography. No. II., construction and sanitary appliances subdivided into (1) Water Supply and Sewage; (2) Heating, Lighting, and Ventilation. No. III., domestic hygiene.

The committee are carefully scrutinising the applications for space for exhibits, with the view of selecting only such appliances as are upon the most approved principles and of the best workmanship, and it is their special desire to make a feature of the most recent inventions and improvements in all matters affecting sanitary science. Many exhibits will be shown in action, and it is intended, among other things, to have a section set apart for competitive plumbing work. This section will be under the immediate patronage of the Plumbers' Company, who will award medals and other prizes in connexion with it. The Exhibition is presided over by Lord Windsor (Mayor of Cardiff), and will be opened by the Prince of Wales on May 1.

OF the large number of public buildings which have lately been erected at Leipsic, the new University Library, which was practically ready for occupation about two years back, has now been finally completed, and the books placed in position. The plans show two principal floors with a basement and an attic floor. The building has a frontage of over 300 ft. Its depth is about 150 ft., with some extra 50 ft. for a large semicircular excrescence which marks the position of the reading-room. There is a covered court with a grand staircase, and two open courts. Besides the principal reading-room, there is a newspaper reading-room, and a suite of exhibition halls for valuable manuscripts. The building is estimated to hold 800,000 volumes, and the cost of its erection, inclusive of such fittings as the book cases, was 2,330,000 marks or nearly 116,000*l.* The plan is a very good one, but the elevations and scheme of interior decoration unfortunately do not do it justice. The nondescript so-called "Italian" Renaissance of the Berlin School has been used by the architect, Herr Arwed Rossbach, and though the façades are well built of fine stone, they compare most unfavourably with the neighbouring Law Courts; they want breadth and dignity of style.

THE "Vienna Congress Exhibition," which is to be opened this month, is not intended to be confined exclusively to matters connected with the Vienna Congress of 1814-1815, but will also combine with it a representation of the arts and culture of the first quarter of the present century. Thanks to the great support the scheme has received from all sides, the Exhibition promises to be most instructive. Not only the Austrian Imperial Court, but several of the Archdukes and a large number of members of the Austrian and Hungarian nobility have placed the works of art in their possession belonging to the above period at the disposal of the Committee. Queen Victoria has also lent the famous representation of the Congress by Isabey. The Emperors of Germany and Russia, the Kings of Saxony and

* Since the above remarks were written, Mr. Brett's letter in Wednesday's *Times* has put us in possession of the case of the Office of Works, which is that many portions of the walls, composed of rubble, were found so decayed as to render the removal of them necessary; but that the portions of the walls against which the monuments rest will be preserved and connected by new work, and the interior be used as a museum. This is perhaps the best that can be done; and it is to be regretted that the Office of Works did not speak out sooner, instead of making a mystery of the matter.

Würtemburg, and the Queen Regent of the Netherlands, are also amongst the exhibitors. Miniatures and works in bronze and ceramic art, as well as furniture of the Empire, will be well represented, together with portraiture and sculptural art of the era in question. The portraits of all the prominent persons of that epoch will be shown. There will also be representations of the festivities at the time of the Congress, views of old Vienna, and specimens of the costumes and uniforms worn at that period. A splendid group will be formed by the state coaches, which have been preserved from that period, and will be lent by the Imperial Court.

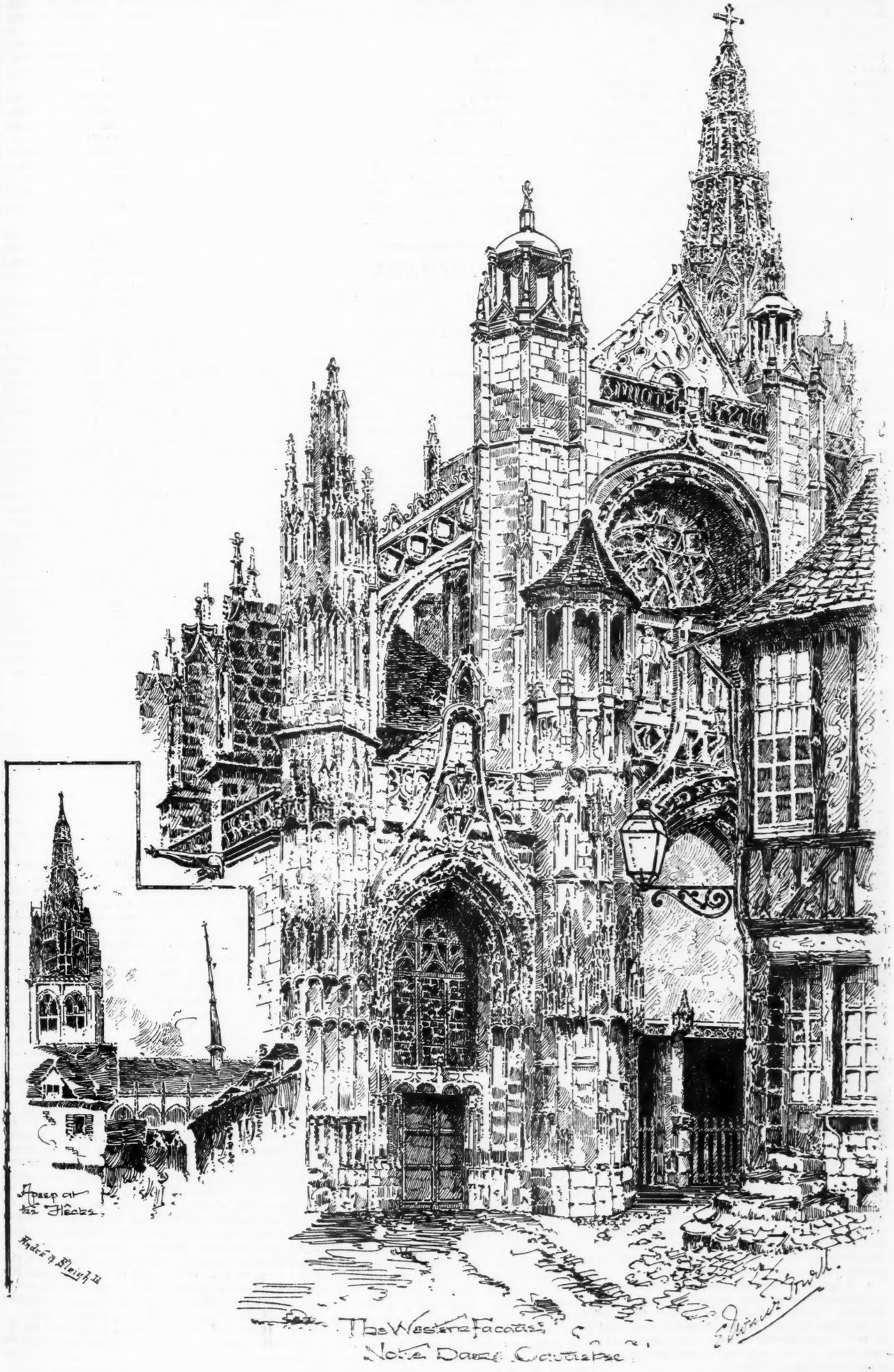
THE elevation of Sir F. Leighton to the Peerage is, we believe, the first example of such an honour being paid to an artist in this country; and considering the official position of the new peer as President of the Royal Academy, it may be supposed that the event is to be regarded not merely as a personal honour to him, but also as evincing the desire on the part of the Government to recognise more fully than before the importance of art and artists to a nation. In this sense, as well as in the personal sense, the new creation will meet with general sympathy and approval. We do not yet hear by what title the new Peer will be known; but we hope that, like one or two other men who have been raised to the peerage in recognition of their exceptional abilities (Lord Tennyson and Lord Armstrong, for instance), the painter will retain his own name as his title, and that we shall only have to exchange "Sir F. Leighton" for "Lord Leighton."

SKETCHES AT CAUDEBEC.

A BEAUTIFUL Gothic church-spire, of open stonework, 330 ft. high, with its flamboyant tracery in the form of fleur-de-lis, like lacework against the blue sky, at first appears to be Caudebec's only attraction, but a walk through its streets soon dispels all anxiety on that score, as the frontage of white houses, with their green jalousies, broad quay, having a double row of clipped elms, serves only as a screen for one of the oldest and quaintest towns on the Seine. The town is built in an amphitheatral form, at the foot of wooded cliffs, from the heights of which extensive views are obtainable over the Seine. Mills, tanneries, bleacheries form the principal manufactories, whilst an active trade is carried on in timber and cider. The town is composed almost entirely of old timbered houses, interesting and curious to a degree, where, wonderful to relate, the "improver" has not tried his cunning, and no modern note comes to mar the ancient harmony.

The Rue de la Boucherie, the most remarkable of all the streets, contains, amongst its other curiosities, portions of an old Convent in the Domestic Gothic style of the thirteenth century. The Church, of course, is Caudebec's chief glory, and dates from 1426, its size and grandeur appearing rather out of place among its humble surroundings, until one learns that this town was formerly a strong fortress and capital of the Pays de Caux. It was ceded to the English in 1419, taken by the Protestants in 1562, and by the Leaguers in 1592. A fine old doorway and ceiling still exist in excellent preservation, belonging to the house of the English king, though the former is now an exit to the stables of a poor hostelry, and the glories of the latter are obscured in what is now the *salle-à-manger* of the same.

The church, built in the florid style of the fifteenth century, decorated and carved as only the Norman flamboyant carvers could carve, is beautifully proportioned in the form of a parallelogram without transepts, the aisle continuing round the choir; the rose window, with its lovely sixteenth-century glass, and triple portal at the west end, being perhaps the chief features. The balustrading to the parapet running round the three sides is in Gothic lettering. Guillaume Latelle, who spent his life on the work, is buried in the Lady Chapel, which has a finely-groined roof, the ribs of which terminate in the centre, and form a pendant in stone 14 ft. long. The flèche forms a picturesque feature, especially as often viewed against the broken skylines, made by the old roofs, and, as if in sympathy with the overhanging antiques they cover, has also fallen out of the perpendicular. Nature has


A peep at the Towers.
The Western Facade
Notre Dame Coutances

dealt very lovingly with this weather-worn quaintness, softening every angle, and throwing a silvery hue over all, its lead covering appearing as silver, especially under the crocketted coronals.

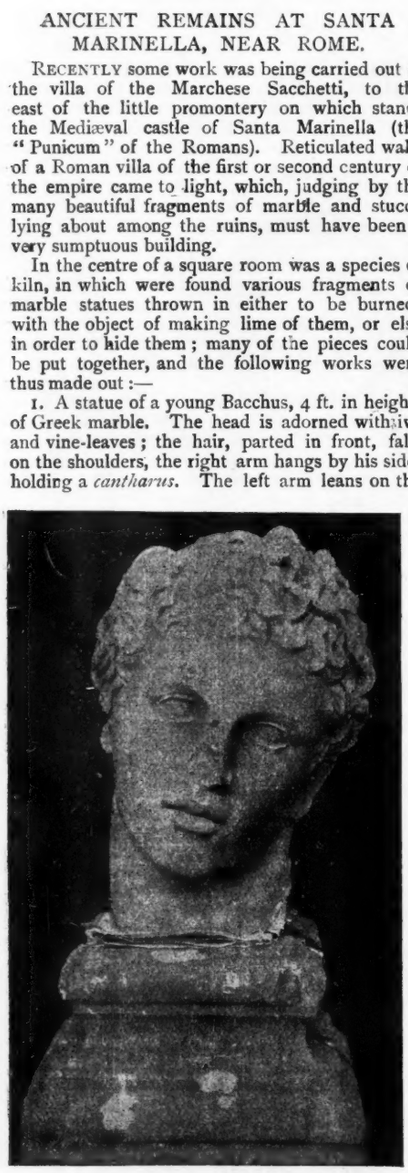
Caudebec wakes up twice a year; this is on the occasion of the Mascaret or La Barre, the great tidal wave, which, sweeping up the Seine comes to a climax at this point. People come long distances to see it, and for a week the place is full, and the quay transformed into a bazaar, with stalls and caravans. Before the coming of the wave the river is cleared, boats seeking shelter in creeks further down. At the advent of the Mascaret an unusual hush seems to prevail over Nature, giving place to an uneasy rustling of the leaves overhead, and a troubling of the waters. Soon the rushes and leaves far down the river may be seen swaying before a thin white line of foam stretching right across from bank to bank, sweeping along, and gathering force as it comes. Its distant thunder turns into a roar, as the great wall of water hurls itself over backwaters and quays, till it exhausts itself a little above Caudebec. E. TURNER POWELL.

ANCIENT REMAINS AT SANTA MARINELLA, NEAR ROME.

RECENTLY some work was being carried out at the villa of the Marchese Sacchetti, to the east of the little promontery on which stands the Mediæval castle of Santa Marinella (the "Punicum" of the Romans). Reticulated walls of a Roman villa of the first or second century of the empire came to light, which, judging by the many beautiful fragments of marble and stucco lying about among the ruins, must have been a very sumptuous building.

In the centre of a square room was a species of kiln, in which were found various fragments of marble statues thrown in either to be burned, with the object of making lime of them, or else in order to hide them; many of the pieces could be put together, and the following works were thus made out:—

1. A statue of a young Bacchus, 4 ft. in height, of Greek marble. The head is adorned with ivy and vine-leaves; the hair, parted in front, falls on the shoulders, the right arm hangs by his side, holding a *cantharus*. The left arm leans on the



Antique Head found at Villa Marinella.

trunk of a palm, the hand pressing a bunch of grapes. At the foot of the palm, and with his back to it, is a small figure of Pan, with the usual goat's legs, and the head raised. A portion of the feet and the plinth are wanting to the statue of Bacchus; on the plinth must have been the panther, of which only the head remains.

2. A fine statue of Meleager, of Greek marble, a representation of the work in the Vatican Museum. To a similar statue belongs the head in the Villa Medici. A similar statue was found in that same locality during some excavations carried out in the early part of the century, and is now in the Berlin Museum.

3. A head in Greek marble, broken from the figure; apparently that of Athene.

4. A statue of Apollo, of which only the head and the lower part of the legs have been recovered. The god is represented with his hair dressed as a woman's, and with a crown of laurel.

5. Fragments of a bas-relief, on which is represented the birth of Bacchus, or rather his presentation by Mercury to Jupiter. The latter is seated, holding the sceptre in his left hand; the right is extended in the act of receiving the infant Bacchus whom Mercury is presenting to him.

Among the ruins were also discovered three marble bases of columns, a foot and a-half in diameter, ornamented with leaves; several pieces of fluted columns, capitals of the Ionic order, and columns of various sizes, of white and grey marble, of *breccia corallina* and *pavonazetto*.

L. B.

Illustrations.

UNDER THE WEST FRONT ARCHES, PETERBOROUGH.

THIS drawing, a view taken from a somewhat unusual point, close up to the south-west pier of the great front arches of Peterborough Cathedral, and looking right up into the archway, has been made by Mr. Horsley and published on this occasion partly in consequence of the special interest at present attaching to this grand architectural feature, in consequence of the anxiety which is felt as to its security, and the important question what are the best steps to be taken in regard to it. On this subject some further remarks and information will be found under a special heading on page 5, so that we need not say more here, and Mr. Horsley's fine drawing sufficiently explains itself.

SIR LAUNCELOT IN THE CASTLE COURT.

THIS fine conception by Mr. Patten Wilson of the courtyard and surrounding buildings of a castle of the Arthurian legend is in illustration of a passage from Mallory's "Morte d'Arthur," suggested by the editor of this journal as a subject for an architectural picture. Sir Launcelot had in the first instance killed a churlish porter who opposed his passage over the bridge leading to a castle, and the people in the village at the end of the bridge denounced him for having slain the porter of the castle:—

"Sir Launcelot let them say what they would, and straight he went into the castle; and when he came into the castle he alight, and tied his horse to a ring on the wall; and there he saw a fair green court, and thither he dressed himself, for there him thought was a fair place to fight in. So he looked about and saw much people in doors and windows, that said, Fair Knight thou art unhappy."

Of course the main point for consideration here was, what were the buildings like which surrounded that "fair green court," and Mr. Wilson has taken the moment when Sir Launcelot first rode into the courtyard, before his dismounting and the appearance of "much people" in the doors and windows, though the armed man leaning over the balustrade in the foreground seems much occupied with the appearance of the strange knight, and will probably give the alarm in a moment.

The architecture seems very suitable to the legendary period of Arthur, in its combination of richness of detail with vagueness and uncertainty of style; there is an old-world look about the whole which is quite in harmony with an old-world story.

LUDGATE IN THE TIME OF HENRY VIII.

IN continuation of the series of views of Old London, which we have given in THE BUILDER from time to time, during the last twelve years, we now add to the list a drawing looking down upon Old Ludgate, and showing its surroundings. It is the kind of view which might have been obtained from the tower of old St. Dunstan's church, supposing it to have been lofty enough. In the immediate foreground, to the right, is seen St. Bride's church, with its lofty pinnacled tower, which forms such a conspicuous object in all the panoramic views of Old London taken before "The Fire." In the foreground, near to where Shoe-lane joins Fleet-street, is seen the old Conduit, which is described as having been crowned by a large statue of St. Christopher standing upon a tower, within which were chimes of bells "worked by machinery" (we presume set in motion by water-power). In the opposite corner, on the east side of Shoe-lane, was a mansion called "Old Bourne Hall" (Holborn). The unfortunate letter H seems to have presented insuperable difficulties to our ancestors. In London and its neighbourhood it has usurped positions to which it has no right, such as "Hanwell" and "Harrow," which ought to be spelt "Anne Well" and "Arrow."*

Behind Old Bourne Hall is shown the Fleet river, or, as it was sometimes called, the "River of Wells," crossed by the Fleet Bridge, an arch of which exists (or did lately exist) in the sewer.

The City Ditch, after following an independent course beneath the wall which united Ludgate and Newgate, and probably added to the unhealthiness of the great debtor's prison which stood over the gate, fell into the Fleet river close to Blackfriars.

Ludgate itself stood across the street, and derived its name, so it is said, from King Lud. The well-known Lambeth manuscript called "Cronycullys of Englonde," tells us "After the death of Kynge Ely regnid his sone Lud" . . . . "and he lete make a fayre gate and called hit Lud Gate after his name." It is needless to say that this (if it ever existed) is not the gate shown in our drawing, which appears to have been erected by Sir Stephen Forster, who also rebuilt the prison for debtors, with its chapel and other buildings, which would appear to have extended from the gate along the wall. There is a pretty little bit of romance about Forster. He was one of the unfortunate debtors shut up in the prison. Being a very good-looking young man, and having a pleasant way with the ladies, he was deputed by his fellow-prisoners to beg for the poor debtors at the wicket. A very wealthy widow passed more than once this way, and finding that the young man's debts could be compounded for by a sum of twenty pounds, she disbursed the sum and took him into her service; need we say that eventually she married him. But what is far more uncommon in history is the fact that he remembered the sufferings of the companions of his imprisonment, and rebuilt the grim old dungeon in a more comfortable and decent manner, supplying it with water, and abolishing the cruel practice of making the helpless debtors pay for water and lodging, as the inscription which he placed upon the "Long Ward" testified:—

"For lodging and water prisoners here nought pay,
As their keepers shall all answer at dreadful Doome's Day."

Unfortunately this warning of good Sir Stephen Forster's was disgracefully ignored in later times, and the extortions of the warders and keepers of the Fleet Prison became notorious.

Stephen Forster became Lord Mayor of London in the year 1444.

The old Gate, of which there are several views extant, was rebuilt in 1586, and, in addition to the statue of King Lud, it was adorned by one of Queen Elizabeth. Both statues are still in existence.

A vast space enclosed within its own walls, entered by its own gates, and independent of the jurisdiction of the City, existed to the south-west of Ludgate, and was occupied by the monastery of the Black Friars or Dominicans. On so large a scale was the monastery erected, that the Parliament frequently met within its walls. One of these meetings has a historical and melancholy interest, as it was that in which were commenced the divorce proceedings against Queen Catherine of Aragon. Within the enclosure stood the great church of the monastery, which, judging from old views, appears to have consisted of a nave and aisles, with a long chancel, having a slender tower near its junction with the nave. The cloisters were on the south side, and the buildings must have reached almost to the Thames. Upon rebuilding the offices of *The Times* newspaper some years ago extensive remains, which would appear to have formed portions of the sub-structures of the dormitory, were discovered, a painting of which is deposited in the Guildhall Museum. To the north of the monastic church, within the enclosure, was the parish church of St. Anne, with its slender square tower, shown in several eighteenth-century views. The beautiful thirteenth-century tower-arch of this church was in existence so late as the year 1854, and in the library of the Guildhall is a water-colour drawing of it. Near to St. Anne's was an angle-tower or guard-house of the old City wall, drawings of which were made in 1792.

If we had passed through Ludgate in the sixteenth century, at about a hundred yards to the

* The arms are a sheaf of *arrows*.

east we should have found another gate leading into St. Paul's Churchyard. Through this gate to the left was the Palace of the Bishops of London, and to the right the Deanery. Of the Deanery we have a very complete description given in the report of Cromwell's Commissioners, but strange to say we know very little about the Bishop's Palace. What is known about it and the surroundings of St. Paul's Churchyard will be found collected and described in the various and most interesting writings of the Rev. Dr. Sparrow Simpson, whose delightful books are known to everyone who takes an interest in old London, and in a paper by the writer published in the *Newbery House Magazine* for April, 1891.

With regard to the vast Cathedral, which stood in the centre of the great space called St. Paul's Church Yard, we have not very much that is new to narrate, as we have frequently described it in the *Builder*. There is, however, one point upon which we should like to say a few words—it is the question as to whether it had a "Galilee." We cannot help thinking that it must have possessed such a feature, and we give briefly the reasons in favour of this supposition. On a tablet hung up in the church, it was stated that the building was 690 ft. long. But the examination of the foundations by Mr. Penrose makes the church 150 ft. shorter (discarding the Portico added by Inigo Jones). But Inigo Jones states that he had great difficulty in obtaining good footings for his portico, on account of the foundations of old buildings which he came across beneath the ground. It has been suggested that these may have been the remains of the Palatinate tower; but the Palatinate tower must have stood nearer to the site of the Deanery.

Sir Christopher Wren also refers to the evidences which he met with, of the church having been lengthened at some period, which addition had evidently ceased to exist at his time.

There are also certain circumstances related by Dugdale concerning the interment and funeral of Bishop Michael de Northburgh, who, by his will, dated 1361, left directions that he should be buried "outside the great west-door of the Cathedral;" that at his funeral his face should be exposed, and his bier surrounded by twenty poor men holding torches. Now we do not know of a single example of a Mediæval Bishop being buried *outside* his Cathedral. But the Galilee seems to have been a frequent place of interment. Thus we find a great number of early Popes were interred in the "Paradisus" or Galilee of Old St. Peter's at Rome. Many Bishops were buried in the narthex or Galilee of the Cathedrals of Goslar, Hildesheim, and Freising in Germany. And one of the Bishops of Durham is buried in such a situation as that suggested by the will of Bishop de Northburgh; that is to say, outside the great west door-way, but inside the Galilee of the Cathedral.

Another very significant fact is related by Dugdale; in enumerating the memorial-stones *within* the Cathedral which were destroyed by Cromwell's Commissioners, by tearing off the brasses, &c., he mentions that of Bishop de Northburgh, from which it is evident that the tomb was in a Galilee or narthex.

The arrangement of the west front in our view is chiefly derived from Vischer, who shows the ogee turrets, and Hollar, who gives the dwarf spires flanking the aisles. As we have pointed out in previous articles upon Old St. Paul's, it was the only Cathedral in England which had cloisters on both sides. The spire of the bell-tower, or "Clockhard," is shown to the right of the Cathedral,* and a little further still to the right is the lofty spire of St. Lawrence Pountney.

The spire of the Cathedral, the "Clockhard," and St. Lawrence, were constructed of wood covered with lead, but that of St. Dunstan-in-the-East (shown still more to the right), was of stone. Was it the only stone spire in London erected in Mediæval times?

London Bridge and St. Mary Overy, now St. Saviour's, are shown in the distance.

If the old monastic buildings which existed down to the end of the seventeenth century, and the Palace of the Bishops of Winchester adjoining, had been preserved to the present day, they might have been very valuable as residences for the Bishop and clergy of the newly-established Cathedral.

It is said that the beautiful circular window at the east end of the great hall of the ancient Winchester Palace still exists, and we have more than once asked the question whether any of our readers can give us any information upon the subject? It has been reported that this window, which is engraved in Britton's "Christian Architecture," and in a view by Sewell, is built up in the wall of a warehouse, where it can still be seen. We have not, however, come across anyone who has seen it. H. W. B.

* This is shown in the view of the old Cathedral published in the *Builder* for January 2, 1892.

THE NATIONAL PORTRAIT GALLERY.

WE give this week a view of the National Portrait Gallery, from a drawing made on the spot by Mr. W. Monk. The view is taken from a point in Charing Cross-road, showing prominently the principal north block of the building. A plan and section are given (page 12), for which we are indebted to the kindness of Messrs. Christian & Purday, the representatives of the late Mr. Ewan Christian, the architect of the building. Mr. Ewan Christian was commissioned by the donor, Mr. W. H. Alexander, in 1889, to prepare the plans, &c. The building was not quite completed at the time of Mr. Christian's death, which occurred in February last. The building is situated on the east and north sides of the National Gallery; that on the east side facing St. Martin's-place—which is a narrow building and forms a screen to the blank wall of the National Gallery—has been treated as a continuation of Wilkins' design for the front of the National Gallery. The north building, extending from the entrance on the east side to the Barracks at the west end, Mr. Christian considered he was free to adopt a bolder and less severe style, and has designed this part of the building after the manner of the Florentine palaces, with bold semi-circular-headed windows to the first floor, and having a massive projecting cornice and basement.

The east wing consists of three floors, the ground-floor being 2 ft. 6 in. below the level of the entrance-hall, and is devoted to large pieces of sculpture and busts, and has a separate sculpture entrance. On the first floor, which is entered from the landing of the principal staircase over the entrance-hall, is a top-lighted gallery, 41 ft. by 20 ft., and two other galleries lighted by windows; and above these, behind the parapets, is ample space for the photographer's gallery and storage-rooms. There is also a service staircase and two students' rooms on the ground and first floors, at the south end of this wing.

The north building consists of five floors, viz., lower and upper basements, ground, first, and second floors. The two basement floors were obtained by the great depth that it was found necessary to go for a good foundation, and are respectively 10 ft. and 11 ft. 6 in. from floor to floor. The lower basement floor contains the police offices and boiler-chamber, and storage rooms; and on the upper basement floor are placed the heating-chamber, librarian's room, library, lady students' and messengers' rooms, and gentlemen's cloak-room.

The ground floor is devoted chiefly to administration offices, consisting of trustee's board-room, secretary's room, reference library, waiting-room, and cloak-room for the use of the trustees. These are all entered from a central corridor 13 ft. 6 in. wide. On the first floor are suites of galleries on the north and south sides, well lighted by high windows, one of which galleries is subdivided by wedge-shaped screens, sloping to the light, for small paintings and miniatures. The top, or principal, floor consists of eleven top-lighted galleries—one measuring 58 ft. by 17 ft., three about 40 ft. by 20 ft., and seven others of smaller dimensions. A service staircase extending from the lower basement to the roof, and two repairing rooms with the picture lift, is placed at the south-west angle of the building. A public lift is also provided from the ground to the top floors. The entrance-hall and principal staircase is placed at the junction of the east and north buildings. The staircase consists of a centre-flight 11 ft. wide, and two side flights each 6 ft. 3 in. wide, connecting each floor, and shut off from each floor by glazed swing-doors.

All the floors and roofs (with the exception of the sky-lights) are built of fireproof construction, the principal floors being on the Fawcett system. The gallery floors are finished with teak block-flooring, and the staircase-landings and entrance-hall are of marble-mosaic, by Messrs. Diespeker & Co. The walls of all the galleries are boarded with 1½ in. deal boarding on oak battens, on which canvas is stretched, the finished surface being a specially-printed paper of a green colour, manufactured and hanged by Messrs. Hayward & Son. The joinery work throughout to the principal floors is of teak, and the whole of the roofs are covered with cast-lead, the rain-water pipes being specially made of 9 in. by 6 in. square glazed earthenware pipes, built 4½ in. into the walls. The heating is by Messrs. Haden & Co., and is by hot-water and hot-air; the hot-air flues being built of salt-glazed bricks, and carried up the north and south walls of the central corridor, and then branching off into the centre of the galleries, and covered with an ornamental iron grating. The external fronts, facing Charing Cross-road and St. Martin's-place, are faced with brown Portland stone, and with Penrhyn granite basement. The semi-circular arches over the first-floor windows contain busts carved by Mr. Thomas, jun., of men celebrated for portrait-painting, sculpture, and literature. Of twelve of these busts we give illustrations, which will be found on pages 14 and 15. They are grouped there in reference to the date and literary or artistic associations of the persons represented, not in the order in which they are to be found on the building.

The works generally have been carried out by Messrs. Shillitoe & Son, of Bury St. Edmund's.

THE NEW IMPERIAL SUPREME LAW COURTS AT LEIPSIC.

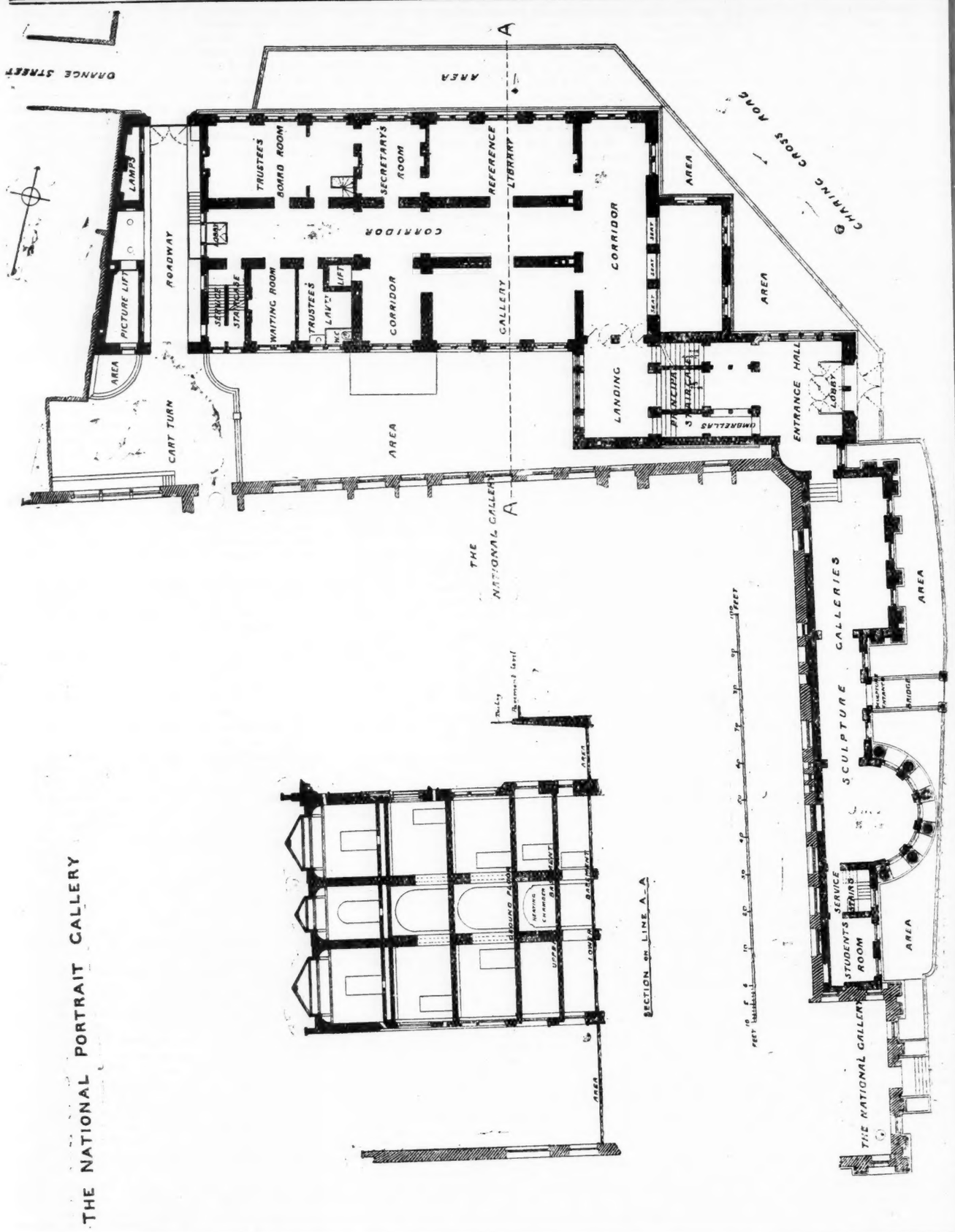
IN the course of the present month Germany celebrates the twenty-fifth anniversary of the foundation of the new Empire, which took place early in 1871, soon after the Franco-German war. These first twenty-five years of the Empire are marked by numerous important structures, and among these the new Houses of Parliament at Berlin and the Imperial Supreme Law Courts at Leipsic, for obvious reasons, take the first place, though there have also been buildings, like the new railway terminus at Frankfort, which are of greater interest as typical examples of a modern era.

We have had an opportunity of publishing some illustrations of the Imperial Houses of Parliament at Berlin, and we have described the building at some length on two occasions, remarking, that as far as the architectural treatment was concerned, the whole rendering of Professor Wallot's massive building was essentially suitable for a country which is strong, resolute, stolid, and practical, but still influenced by the recent memory of a great conquest.

In the case of the new Law Courts at Leipsic we have an example of German academic work which avoids the vulgarity and vagaries for which the Berlin "school" is so unfavourably known, and exhibits a certain dignity which is one of the most typical features of the Leipzig judicial circles as distinct from any other section of German officialdom. As the architecture of the Houses of Parliament is essentially in keeping with the chief characteristics of the German nation, the treatment of the Law Courts is essentially in keeping with the dignity of the Leipsic tribunal. Even the absence of that constant repetition of patriotic and warlike emblems in the sculptural decorations, which is so unfortunately conspicuous in other public works, typifies the independence of this institution, which stands quite apart from German popular feeling.

The architect, Herr Ludwig Hoffmann, gained his commission in an open competition held in 1884, in which 119 competitors took part, and the jury included five architects holding important Government appointments. There were five premiums, with a total value of 200,000 marks, or 10,000*l*. Herr Hoffmann, at the time of the competition, was only about thirty-five years of age, and, though he had participated in practical work as an assistant, notably at the new home for the Military Academy at Berlin, he had never carried out work on his own responsibility, nor had he practised in any way as an architect and surveyor. He had passed the Government examinations as an "official" architect, and had gained some academic distinctions, particularly in the competition for the new museums at Berlin, but he was otherwise quite unknown to the authorities and to the profession.

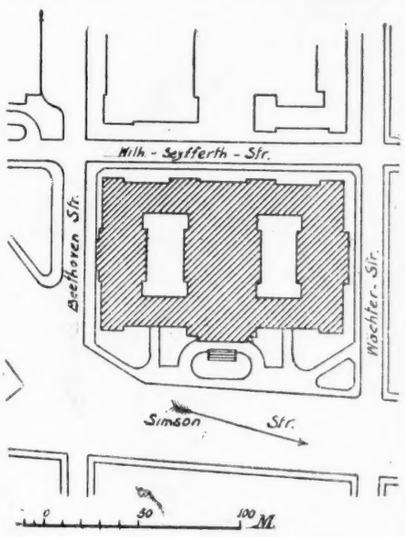
The competition for the design of the Law Courts was the result of an Imperial Act passed in 1877, according to which the supreme tribunal was definitely given to Leipsic, in the kingdom of Saxony, and the erection of a *Palais de Justice* determined on. Provisional quarters of a fairly satisfactory description had, however, been found, so that the scheme of giving the tribunals a new home was by no means hampered by any lack of time. Herr Hoffmann's design, which was prepared whilst he was travelling with an assistant, Herr Peter Dybwad, of Christiania, was placed first on account of the excellence of the planning; the architectural treatment in



Florentine Renaissance style, was considered exceedingly commonplace. There was an unusual amount of opposition against the commission being given to an architect of so little experience; but eventually, after much discussion, a preliminary order was given to the effect that he should prepare further plans in accordance with a revised "programme" of requirements. The estimate for the building as shown in the competition drawings was 2,300,000 marks, or about 115,000*l*. The revised plans, which were put before the authorities in 1886, were estimated to require 4,300,000 marks, or about 215,000*l*. These revised plans showed numerous improvements, though the main lines of the competition plans were not materially altered. The architectural treatment, now altered to a severer form of Renaissance architecture, was more satisfactory. The revised design pleased both the authorities and the "Reichstag," and as there was some feeling at the time that buildings of this class should be carried out in the best possible manner, instructions were given to the architect to continue to develop his scheme on "monumental lines." This second revision, which again showed numerous improvements, also convinced the authorities of Herr Hoffmann's ability, and though the estimate for this second set of drawings, which figured at 6,455,000 marks, or about 322,000*l*., had to be cut down to just under 300,000*l*., the work was finally entrusted to his care. An experienced technical adviser was, however, put at his disposal as a kind of superior clerk of works, and difficult questions in construction had to be referred to a specialist. Herr Scharenberg filled the office of clerk of works, and Herr Cramer, of Berlin, was the consulting engineer. The staff put at Herr Hoffmann's disposal included Herr Dybwad, who had assisted him on the original set of competition drawings, Herr Wendorff, whose name we have frequently recorded as a winner of school-house competitions, Herr Boethke and Herr Werdelmann, together with a number of junior assistants. It is interesting to note that there were special

allowances both for Herr Hoffmann and his assistants to enable them to travel in Italy and other countries during the progress of the works, to make studies of details, &c.; and further, that plaster models were made of almost everything in the building as to the effect of which the architect was doubtful. These models included full-size renderings of entire sections of the façades, columns, &c., as well as minor fittings, such as door furniture; and the modelling department required a permanent resident sculptor with from four to ten assistants, according to circumstances. Herr Hoffmann was a most methodical worker, and no trouble was too great for him in his enthusiasm. Having decided to adapt his building to a certain period of Italian Renaissance, he was indefatigable in research work as well as in the preparation of comparative studies, from which he derived considerable assistance. He similarly gave much time to the study of all technical matters, such as the warming, ventilation, or the lighting of the building. Commencing the work with little or no experience, he showed a remarkable ability to master facts and control the works as they progressed, and there is little doubt that the courtyard façades, which were determined after the exterior, and the interior decoration, which was, of course, settled on at a yet later date, are respectively better than the earlier parts of his design.

The site-plan appended shows the position of the block with its approaches. There is a principal entrance from the front, which is approached



Plan of Site.

by a carriage sweep; there is a carriage entrance in the south side and an ordinary entrance on the north side, and four minor carriage entrances to the courtyard, for service purposes only. The accommodation which had to be provided was a large court for special cases, such as high treason, and six ordinary courts. A large library had to be provided, also a suite of reception and living rooms, for the President of the Tribunal, which, by-the-by, consists of some eighty judges divided into eight courts. The necessary offices included chambers for the judges and offices for the Public Prosecutor, as well as committee and retiring-rooms for the advocates. The plans practically explain themselves, as it will be seen that on passing through the main entrance the visitor first reaches a vestibule and then steps into the large *salle des pas perdus*, which in this case is in the form of a Latin cross with a cupola. Three of the courts, with their retiring-rooms, are at the end of the hall, whilst the other three are on the floor above, in the same position. There is a grand staircase to this floor, and a gallery runs round the hall. The principal court is also on the upper floor, and has been placed over the vestibule. The advocates have their rooms opposite the staircase on this level; whilst the Public Prosecutor has his offices on the lower floor. There are ample passages, which are well lighted from the courtyards, and off these are the chambers referred to above. The library takes up the central part of the north front, and has been planned for 200,000 volumes. The necessary reading-rooms for the judges and advocates, the loan library offices, the librarian's study, &c., are all conveniently placed near the library proper. The approach to the library is through the north entrance, which is also used as the private entrance for the Judges. Two minor staircases are planned on this side of the block. The President's suite is on the upper floor, and takes up the entire south front of the building. The carriage entrance has a staircase on either side of it, of which one is used for receptions, and the other leads to the private apartments. The reception-rooms include a large ball-room and a large dining-room, with the necessary ante-rooms, whilst the suite of living-rooms affords the usual accommodation provided in Germany. A second or minor suite is on the floor below, should the President require more space, and some special guest-rooms have also been provided. It will be seen that the President's study has an entrance from the main passage as well as from the suite, with ante-rooms on either side. The kitchens and offices are on an entresol under the dining-room. The second floor is almost entirely taken up by store-rooms for the record department of the institution, whilst the basement is occupied by minor offices, the tenements for the caretakers, &c., and a small printing-office. The necessary boilers and machinery are under the pavement of the north courtyard, and the position of the large flue from the boiler-room will be seen on the north-west corner of the plan.

The principle of showing the arrangement of the interior on the façades has been systematically adhered to, excepting in the case of the crowning feature of the building, which, besides being ugly in shape, is unfortunately a sham of the worst description. The yet uglier glass cupola on the Berlin Houses of Parliament at least has an excuse for its existence owing to the fact that it serves as "top light" for the principal Council Chamber. The existence of the central feature at Leipzig is an almost inexplicable blunder on the part of such an academic worker as Herr Hoffmann.

A rich Saxon freestone has been used on all the elevations excepting part of the south front, where a finer stone has been introduced, and special care has been taken in the working of the surfaces of the material, which varies considerably according to the altitude above the pavement. The working of the stone was subject to innumerable experiments based on the result of much careful research as to the methods of the Italian masons of the fifteenth and sixteenth century. From the elevations the extent of the sculptural work will be seen, and it has been concentrated on certain important points and not spread indiscriminately over the building, as is unfortunately mostly the case in Germany. Good sculptural work by men like Professor Lessing also takes the place of the nondescript "cheap" work so frequently found in Berlin and other large German towns.

As in the case of the Imperial Houses of Parliament, we must defer our description of the interior for another article, when we shall publish some further illustrations of the building. We will only here point out that the architectural treatment of the interior certainly calls for the attention of any architect visiting Germany, more especially some of the oak joinery in the courts. The *salle des pas perdus* shows some interesting masonry, whilst the two courtyards are remarkably well-designed. The elevations of the courtyards are generally recognised as the most successful feature in Herr Hoffmann's building, and are certainly of exceptional dignity.

The Emperor, who opened the building in October last, made a special point of expressing his satisfaction, and promising the architect further work at an early opportunity. Numerous distinctions were conferred, including the title of "Baurath" for Herr Hoffmann and decorations for his principal assistants, the clerk of works and contractors. The works had been commenced in 1887, and the foundation-stone laid by the Emperor in October, 1888. The building was ready on the date promised by the architect, *i.e.*, just seven years after laying the foundation-stone, and, what is more remarkable for a German Government building, the estimates, we understand, have not been exceeded.

THE NEW MUNICIPAL THEATRE AT PALERMO.

THE municipal theatre at Palermo, in Sicily, of which we reproduce a drawing of the elevation, a longitudinal section, and two plans, is one of the principal works of the late Professor G. B. Filippo Basile. The history of the building is a long one, commencing with an international competition, which was held in 1864. Some thirty-five designs were sent in at the time, and a jury, which included the late Gottfried Semper (Dresden), Mariano Falcini (Florence), and Saverio Cavallari (Palermo), decided to award the first premium to the deceased Professor. During the twenty-five years that followed, the theatre was almost constantly a subject for local controversy, and though the foundation-stone was actually laid in 1875, ten years after the international competition had been decided, and the commission had been wisely entrusted to the architect who had obtained the first premium, we cannot even to-day consider the building complete, as much of the proposed decoration has had to be postponed. From 1875 till 1881 the works at least made some progress, but from 1881 till 1890 scarcely anything was done owing to a dispute between the municipality and the contractors, as well as for political and other reasons which do not concern us. In 1890 there was again some activity on the site, but owing to the death of the architect soon after the works had again been taken in hand, there was some further delay. The son of the deceased professor, Signor Ernesto Basile, was then commissioned to take his father's place, and has so far completed the block that it could be handed over to the theatrical company.

It may be well to mention that the late Professor Filippo Basile was one of the most popular figures among Italian architects, and was recognised as a leading authority by his Government, and by the architectural societies of his own and other countries. He held numerous distinctions and orders in Italy, and among the distinctions conferred upon him by other countries we notice that the Royal Institute of British Architects made him an Hon. Corresponding Member in 1887, and that he was made an officer of the Legion of Honour of France in 1878, on the occasion of the Paris Exhibition of that year. Professor Basile was born in 1825. Both during his school education, as well as during his training for the profession, he gave much attention to botany and natural history, and this will explain his great delight in adapting flowers and leaves for the purposes of the mason, and his great success in the rendering of floral friezes and panels with floral subjects. His professional studies were principally at Rome, but they were interrupted by the unfortunate events of 1848, when he had to take charge of some fortification work at Palermo. His practice was an extensive one, with its headquarters at Palermo, and included, besides the public and private works which he carried out, innumerable academical schemes and much successful competition work. He received a premium at the notable Victor Emanuel Monument competition, acted as architect for the Italian Section at the Paris Exhibition of 1878, and was also a very popular lecturer. Of other theatres erected from his plans, besides the Palermo Theatre, we know of one at Girgenti (1872-1880) and one at Militello (1886-1891). His name was also frequently to be found among the contributors in the Italian journals, and he was the author of several important publications.

In examining the plans it should be remembered that they originated as far back as 1864, and that the works were commenced in 1875, *i.e.*, considerably earlier than the new epoch of theatre-planning, which may be considered to have commenced after the Ring Theatre fire of 1881. The fact that accommodation for a club had to be arranged for in the block must not be forgotten, and it must also be taken into account that in a building around which there have been so many controversies, and which has had such a protracted history, the numerous alterations during the course of erection must have greatly complicated the arrangements, and thus rendered the satisfactory completion of the whole most difficult. Unfortunately the alterations in the course of erection apparently did not include a revision of the staircase planning, which we regret to see is what might have been expected in the sixties. With few exceptions the principal staircases are not on outside walls, and are distant from light and air. The planning of the approaches, exits, and staircases is confusing, to say the least of it, and the number of staircases and their width is insufficient.

The principal entrance to the theatre is through the large columned portico at the top of an imposing but dangerously broad flight of steps. There is apparently only one entrance door from the portico to the spacious grand vestibule. The "area" of the auditorium, which is occupied by two classes of seats, has its main approach through a lobby off the grand vestibule, and there are two minor entrances off the private-box corridors. The six front rows of seats in the "area" take

Holbein.

Vandyck.

Lely.

Kneller.

Clarendon.

Walpole.

Some of the Portrait Medallions on the Exterior of the National Portrait Gallery.—Mr. F. Thomas, Sculptor.

Reynolds.

Hogarth

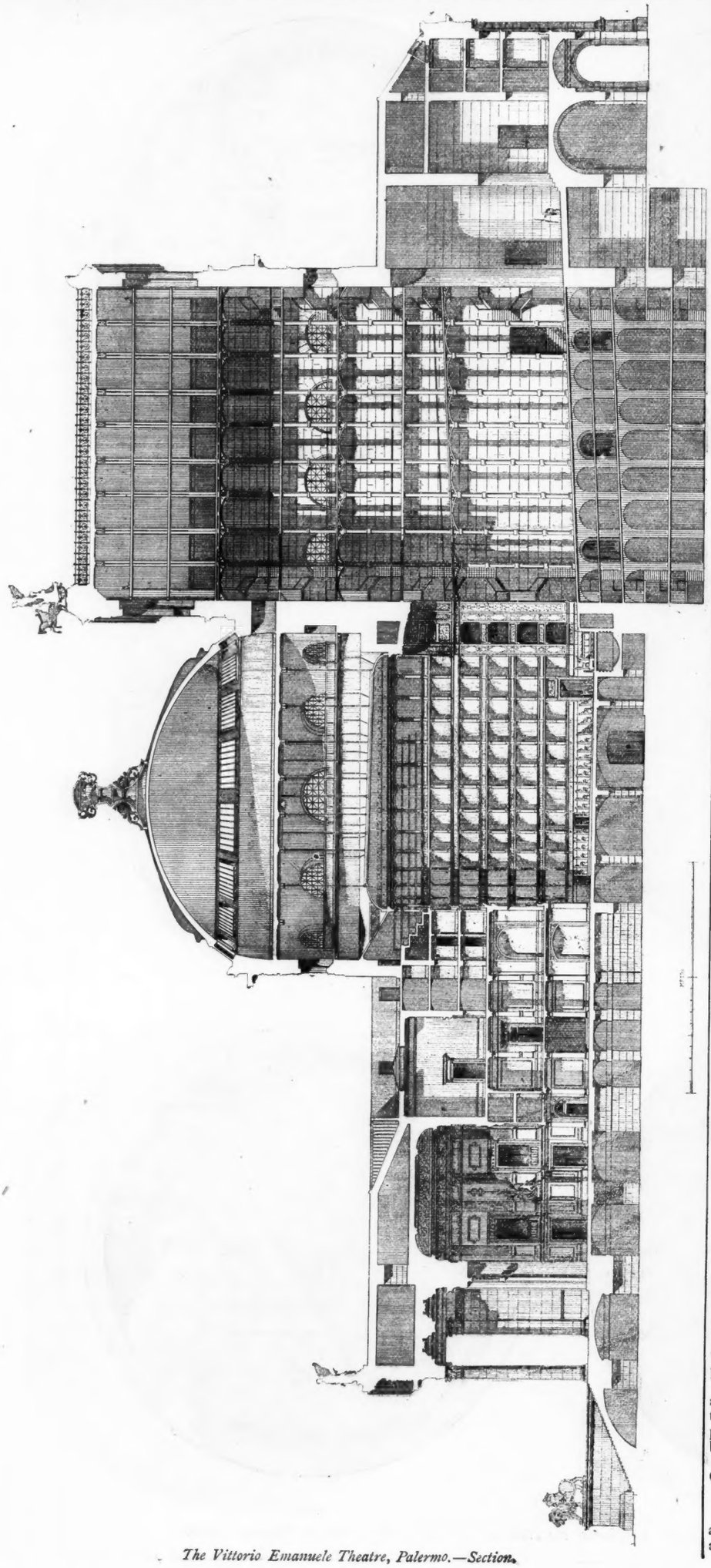
Roubiliac.

Chantrey.

Macaulay.

Carlyle.

Some of the Portrait Medallions on the Exterior of the National Portrait Gallery.—Mr. F. Thomas, Sculptor.



The Vittorio Emanuele Theatre, Palermo.—Section.

the place of our stalls (*poltrone*) whilst the rest of the rows form the *platea*, a kind of reserved "pit." The auditorium is essentially "Italian" in design, having the typical lines of the Milan "La Scala," with five tiers of pigeon-hole private boxes, and some very unsatisfactory sight lines for the side and back seats. Every box has its ante-room, and the very practical provision has been made of having communicating doors between these ante-rooms, so that two or more boxes can easily be joined if larger parties visit the play. The seating capacity of the auditorium is estimated to be 3,100, and this figure is exclusive of the ninety seats in the orchestra which take up a considerable space of the area. It is perhaps interesting to notice that a large central box has been planned on the first tier for the use of the local authorities, and that a separate lobby and staircase has been provided for this *palco delle autorita*. The approach to the special staircase is through a large vestibule at the side of the building. This vestibule is also the usual entrance to the club mentioned above, which, as will be seen from the plans, has a large circular hall with a number of reading and reception rooms on the same level as the first tier, taking up the whole of one side of the building from the front to the proscenium wall. The same planning will be found on the opposite side of the block, but here the circular hall with its adjuncts is used as a foyer or lounge with retiring rooms and buffets for the visitors to the theatre. As in the case of the circular vestibule on the one side, entrances from the street are also planned on the other side below the circular foyer. These can be used by the public, and there are two staircases off this vestibule leading direct to the private boxes. The upper tier of boxes has its separate entrance and stairs on the same side, but at the back of the proscenium wall.

The dimensions of the stage call for attention. It is 37 by 28 mètres, or about 120 ft. by 90 ft., with an additional rear stage of 11 mètres or 36 ft. wide. The French arrangement of having scene-docks underneath the "flies" on either side of the stage has been adopted. If we compare the dimensions of this stage with the stages of other theatres, we find the size to be far over the average of the large continental theatre-stage. The Paris Opera House, for instance, only measures 52 mètres by 25 mètres, or about 175 ft. by 82 ft., and the Vienna Opera House 30 mètres by 25 mètres, or about 98 ft. by 82 ft. As will be seen from the plans, very little space is allowed for storage purposes, as the scenery is very wisely kept outside the theatre in a separate building, and the various properties are carted to and fro, according to the requirements. A scene-slide has been provided to facilitate the transport of scenery to and from the stage. The plan of the back of the house is only remarkable for its ample dimensions and the space accorded to the artists for green-rooms and dressing-rooms.

Structurally there is little to say. Modern methods have been employed wherever possible in the form of fire-resisting construction, electric lighting, &c. Arrangements have also been made so that the auditorium can be used by day with the aid of sufficient top-lights. The materials employed in the façades, it should be mentioned, are freestone, principally from the Solanto quarries. Professor Valenti's name is among the sculptors who assisted in the decorations so far carried out. As to cost, we regret not to have been able to obtain particulars.

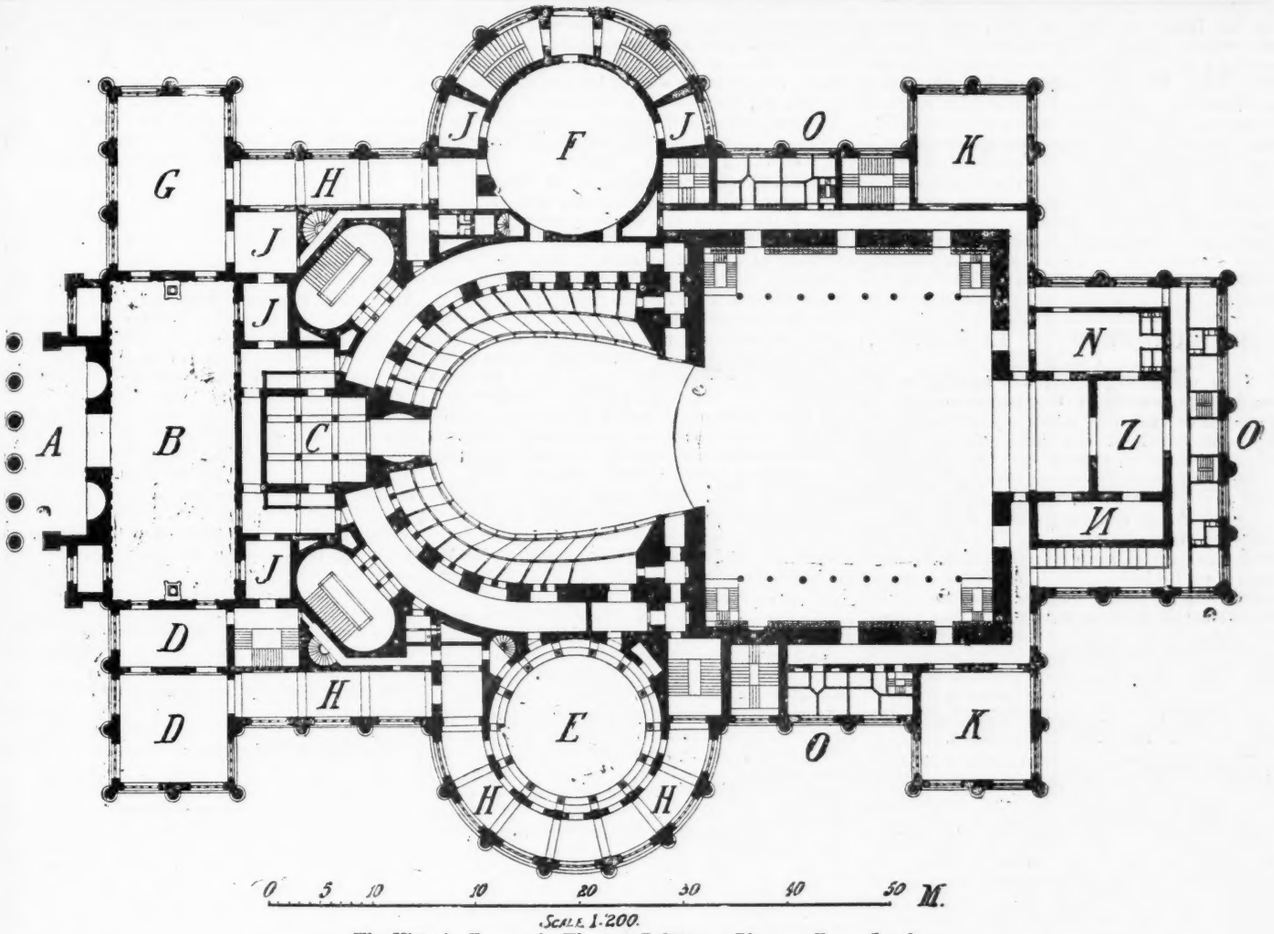
STUDY FOR CHURCH NEAR BOSCOMBE.

THIS is a reproduction, in two tints, from the remarkable large water-colour study by Mr. H. Wilson which was one of the most prominent objects in the Architectural Room at the Royal Academy last year. We have already published the drawing of the interior of the church, which was in the same exhibition (see *Builder* for August 31, 1895), and to which this study for the exterior formed a pendent.

We have endeavoured in the lithograph to give at least a reminiscence of the general effect of the drawing, which showed the building in a prevailing warm but light tint, seen against a blue sky.

CEILING IN THE HÔTEL DE VILLE, PARIS.

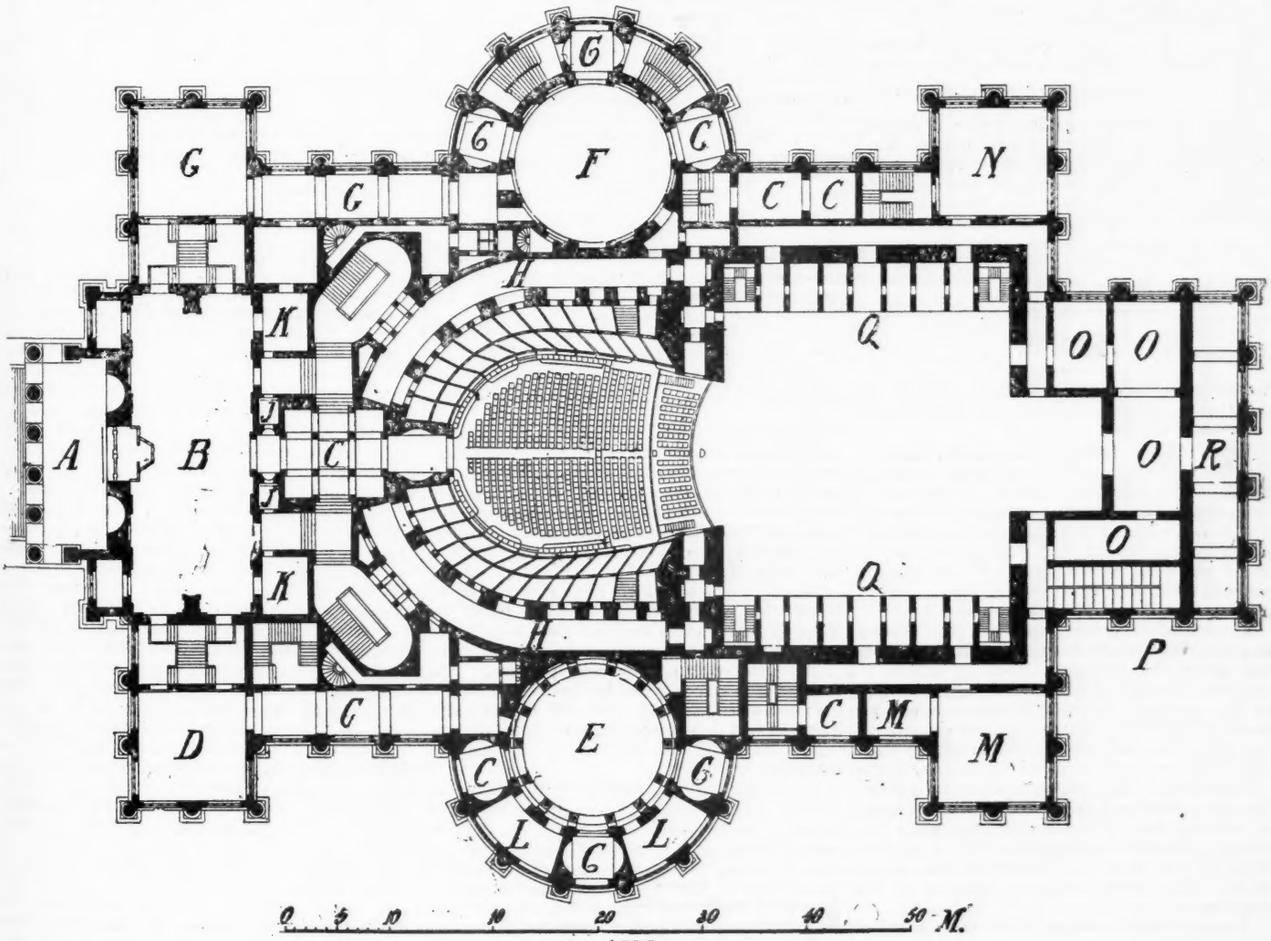
THIS ceiling, which was fixed in position a few days since, forms the decoration to the arcaded room known as the Salle des Lettres



SCALE 1:200.

The Vittorio Emanuele Theatre, Palermo.—Plan on Foyer Level.

A.—Main Entrance.
B.—Grand Vestibule.
C.—Ante Room to Official Box.
D.—Club Room.
E.—Club Hall.
F.—Foyer.
G.—Saloon.
H.—Lounge.
I.—Retiring Room.
K.—Green Room.
L.—Ballet Room.
M.—Store.
N.—Supers.
O.—Dressing Room.



SCALE 1:200

The Vittorio Emanuele Theatre, Palermo.—Ground Plan.

A.—Main Entrance.
B.—Grand Vestibule.
C.—Lobby.
D.—Café.
E.—Club Vestibule.
F.—Public Vestibule.
G.—Belle Vue.
H.—Private Box Passage.
I.—Pay Office.
K.—Hats and Coats.
L.—Police.
M.—Fire Brigade.
N.—Stage Entrance.
O.—Electrician.
P.—Scene Slide.
Q.—Scene Dock.
R.—Arcade.

at the Hôtel de Ville at Paris, and next to the "Salle des Arts" in which is M. Bonnat's ceiling painting which we have already illustrated. The artist, M. Jules Lefebvre, has intended to symbolise the apotheosis of Arts and Literature by a series of aërial figures floating above the Hôtel de Ville itself, the building being introduced at the right-hand corner of the composition by that curious and unsatisfactory device of upward perspective which some able French decorative painters still persist in introducing in their ceiling paintings. The painting is treated in a prevailing light greyish tone of colour, somewhat wanting in force of effect, though the design shows fine qualities both of drawing and composition.

THE MONUMENT TO MEISSONIER, PARIS.

THIS monument, which was unveiled a few weeks ago, stands in the garden called the "Jardin de l'Infante," which adjoins the Louvre, opposite the Pont des Arts. It was raised by a committee formed for the purpose of securing a suitable monument to the great painter, and is the work of M. Mercié, one of the first of living French sculptors, who took his idea for the figure from Meissonier's well-known portrait of himself seated in an arm-chair with his head resting on his hand. He is clad in a long robe and holds his palette in the other hand. The monument is in white marble, and the pedestal is decorated with a collection of military emblems and attributes recalling the Napoleonic history to which Meissonier devoted his principal attention.

DESIGN FOR THE DECORATION OF A PUBLIC BUILDING.

THIS design, which gained for its author, Mr. Harold Speed, the 40*l.* prize given by the Royal Academy for the best design for the decoration of a portion of a public building, is symbolical of "Autumn," and the recumbent or reclining figures in the lower portion of the composition are intended to suggest the Summer going to sleep among the dead leaves, whilst in the upper portion of the composition are embodied the attributes of Autumn. The figure of Autumn has, not unsuitably, something of that power and strength which poets have always liked to imagine as the characteristic of any personification of Autumn, and in which painters have to a great extent followed their lead.

The author has been commissioned by the Royal Academy to execute the painting on the walls of the refreshment-room at Burlington House.

We are unfortunately unable to give more than a monochrome representation of the design. The colour scheme of the original is so rich and satisfactory to the eye, that under more favourable circumstances we should have been tempted to try whether its full effect could have been realised by the aid of chromo-lithography; but this would have necessitated deferring the publication of the design for a considerable time.

Books.

Statically Indeterminate Structures. By H. M. MARTIN, Wh.Sc. Offices of *Engineering*. London: 1895.

SO many books have been recently published dealing with the ordinary difficulties which present themselves to those engaged in designing structural ironwork, that it is a pleasure to find a work in which the author commences at that part of the subject where nearly all others finish, and explains the methods that can be employed for the solution of problems of a more advanced nature.

A practically accurate solution of the stresses in a framework structure with redundant members can always be obtained either by means of diagrams or algebraically, if due regard be had to the principles of elastic deformation, and an excellent paper on this subject was contributed by Mr. A. D. Stewart to the Institute of Civil Engineers, and will be found in vol. cix. of the "Proceedings." This paper, however, only shows how the method can be applied to ordinary cases, as lattice-girders and such structures, while Mr. Martin carries his investigations still further, and deals with nearly all the problems of this nature which occur in the every-day practice of the engineer.

The consideration of one of the many so-called indeterminate problems will be sufficient to show the value of the author's little book. There are now in use several different systems of trough flooring. Such are employed for bridgework, or for carrying large floors of buildings, a construction of this type being adopted for the National Liberal Club at Whitehall. Now, supposing a heavy concentrated weight be placed upon any one trough, the problem is to ascertain how much of this weight is carried by this particular trough, and how much by the adjacent troughs on either side of it. This is a question of every-day occurrence, but we think it is but seldom attempted to investigate the matter very carefully. Mr. Martin, however, shows clearly that, as a matter of fact, there is not much difficulty in arriving at a result sufficiently accurate for all practical purposes; and we feel confident that his method of treating this problem will be very welcome to many who have hitherto thought the question to be one not admitting of a solution. The author naturally deals with many other matters of this character, but the one we have referred to is sufficient, we think, to show that his book ranks much above the ordinary works dealing with the stresses on engineering structures, and those who have already a good knowledge of designing ironwork will discover that the portion of the subject they have considered beyond them is not, after all, so very formidable.

Surveying and Levelling Instruments. By W. FORD STANLEY. Second Edition. London: E. & F. N. Spon. 1895.

THE second edition of this well-known work contains an entirely new chapter on instruments constructed especially for facility in taking inclinations, including a description of Lister's inclinometer theodolite and of the author's gradeometer. The first is designed to set out upon the surface of land the widths of slopes or batters by pegs; it resembles a theodolite, with the addition of an extra vertical axis to the telescope, piercing the horizontal axis at right-angles. The telescope on the horizontal axis can be set by the vertical supplementary axis to any inclination, so that if the vertical axis is set to the slope of a railway cutting any number of points or pegs may be set out continuously with the same setting by direct observation through the telescope, across any irregularity or inclination of the land surface, thus making a great saving of time over the ordinary system of pegging by calculation with the aid of a theodolite, where each peg requires a separate setting of the instrument. Mr. Stanley's "Gradiometer" has a somewhat similar object to that of Short's Gradiometer Level, but is arranged to give a more open scale. It is an instrument in which a screw is made one point of support and a horizontal axis the other; the screw gives an inclination up or down to the extent of 5° 30′, and carries a drum of about 1-in. diameter, and a helix is cut into the periphery of the drum, carrying an index so arranged that a single turn of the screw is indicated on one of the divisions of the scale on the drum to a linear extent of 3 in. The whole extent of the scale is 63 in. for a movement of 5° 30′. Both these new instruments are worth attention.

The Mechanical Engineers' Pocket-book. By WILLIAM KENT, A.M.M.E. John Wiley & Sons, New York; Chapman & Hall, London. 1895.

THE author of this pocket-book has succeeded in condensing a vast amount of valuable information into a comparatively small compass. The book contains all the formulæ and tables that are likely to be required by a mechanical engineer, besides much useful data on all the subjects that can properly be considered as forming part of this branch of the profession.

Twenty years ago Mr. Kent commenced to follow the very excellent advice given by Nystrom that "every engineer should make his own pocket-book to suit his particular business, as he proceeds to study and practice," and during the last four years he has selected from the mass of engineering facts and figures which which he had thus accumulated those which pertained to mechanical engineering to form the work now just published.

The author has been careful not to assume the position of an "authority" in giving rules and formulæ for designing, but prefers to be considered merely as a "compiler" who states not only the names of the originators of the rules—where such is known—but also the volume and page from which they were taken, so that their derivation may be traced when desired.

He has also given much attention to the abstracting of data of experiments from recent periodical literature, and in this very important respect the work will be found quite up to date.

Very great care has been bestowed upon the accuracy and general arrangement of the book, and this, combined with the excellence of the printing, will cause it to be most serviceable to the busy man who in his every-day practice desires to know "results" at once, and has seldom the time to study how such have been arrived at, but is satisfied if they are correct.

Proceedings of the Incorporated Association of Municipal and County Engineers. Volume XXI., 1894-5. London: E. & F. N. Spon; New York: Spon & Chamberlain. 1895.

THE new volume of the Proceedings of this Association is a very good one, and is full of valuable and suggestive papers on practical subjects. Among the subjects treated of may be mentioned "Combined Drainage," by Mr. Godfrey; "Private Drains or Public Sewers," by Mr. Nisbet Blair; "The Theory of Sand Filtration," by Professor Kemna; "Brighton and its Municipal Works," by Mr. May, Borough Engineer of Brighton; "Plymouth and its Municipal Works," by the Borough Engineer of that town; the Royton Sewage Works, by Mr. McCallum and Mr. W. Naylor; &c. The complete technical descriptions of the Municipal works of large towns, by the Engineers who have the best information about them, are very useful, and serve as suggestions either what to provide for or what to avoid in similar works in other towns. The volume is prefaced by portraits of four of the Past Presidents of the Association.

Lockwood's Builders' and Contractors' Price-book 1896. Edited by FRANCIS T. W. MILLER, A.R.I.B.A., with a Supplement containing the London Building Act. London: Crosby Lockwood & Son. 1896.

THIS well-known price-book appears with more than usual punctuality, and appears to possess all its usual good qualities, with some valuable additions. Among other things the new Building Contract and Schedule of Conditions issued by the Institute of Architects, has been with their permission inserted as an appendix, and the London Building Act (1894) is reprinted, with annotations and explanations by Mr. A. J. David, as well as the unrepealed sections of former Acts. The portion of the book dealing with electric lighting, the class of work in which the most rapid alteration may be expected from year to year, has been revised for the year, though we do not observe that anything is said as to the recent tendency towards the use of higher tension currents in private house lighting, and the difference which it requires in the make and cost of the lamps; but perhaps this is almost too recent to be incorporated in an annual publication as yet.

How to Write the History of a Parish. By J. CHARLES COX, LL.D., F.S.A. Second Edition. London; Bemrose & Sons. 1895.

WE presume this book has been found useful as a guide to those who are compiling, or at all events to those who are interested in the study of, parochial annals, as it has reached a second edition. The book however has been largely re-written, and five out of the thirteen sections are new. There could not be a better guide on a matter of this kind than Dr. Cox, who has long been so specially interested in antiquarian studies. He lays down a regular plan for the treatment of parochial history, commencing with etymology and maps, then going on to "Prehistoric Remains," "Romano-British," "Anglo-Saxon," "The Norseman and Dane," and so on in historic progression. Want of methodical arrangement is a frequent defect with writers on topographical antiquities, and they may learn something from the author's suggestions as to classifying their subject. They may learn also to be on their guard against popular archæological superstitions, as, that "low side windows" were for lepers, that statues with their legs crossed were necessarily Crusaders, &c. The treatment of the history of the parish church forms, as it should, subject of a special chapter, treating it on the same system of classification. There are some bitter things said about restorers, which are perhaps justified, though the author, like a good many antiquaries, does not sufficiently recognise the importance of the modern claims on a church in use for worship he just adverts to them, but seems to do so rather against the grain. Two points we may note: first, by his own admission the nineteenth century restorers are not a whit worse in their indifference to the work of their predecessors than were the twelfth and thirteenth re-builders (see the remarks on page 138); second, that the proposal of the author to send to any one

who is going to restore a church, in confidence, a short list of the architects who can be thoroughly trusted with old work, strikes us as a rather cool assumption of the office of censor of the architectural profession.

The Sea-King's Daughter, and other Poems. By AMY MARK, with designs by BERNARD SLEIGH, engraved by the designer and by A. TALBOT. Birmingham: Napier & Co.; London: Tylston & Edwards and A. P. Marsden. THIS is a little book printed at the press of the Birmingham Guild of Handicraft, consisting of two or three short poems printed in decorative lettering with wide margins, and surrounded by borders and head and tail-pieces and symbolical figure decorations. It comes from the same mint as *The Quest*, and has the same affectation of archaism and the same bad figure-drawing. But the little poems are really pathetic, and contain much pretty fancy, and the illustrations wholly accord with them in feeling, and suggest a great deal, so that one cannot be too critical as to the æsthetic standpoint of the writer and artist. They touch our feelings, and that atones for a good deal of artificial archaism.

TRADE CATALOGUES.

THE "Rainbow Engineering Company" send us their illustrated circular on the Rosher system of swimming-baths, the important point being the admission of fresh water through "spreaders" flush with the bottom of the bath, and warmed to the bath temperature, but no higher, before injection. This seems one of the best methods of filling swimming-baths so as to avoid overheating at some points, and cold patches at others. The handrail is utilised as a means for aërating the water in the bath by the admission of a fine spray, such water being also raised to bath temperature by an "annular" heater, before introduction as a spray. The catalogue also illustrates a special form of diving-stage for swimming-baths.

Correspondence.

To the Editor of THE BUILDER.

THE HAYMARKET OPERA-HOUSE.

SIR,—My attention has been called to one of the "Notes" in the *Builder* for Dec. 21, p. 456, commenting upon the proposed new "Opera-house at the Haymarket," and adversely criticising the general arrangement as being opposed to the regulations of the London County Council, and deprecating the relaxation of certain of its regulations and of any modification in this instance of Rule 6. The paragraph then states in particular that in this "modern scheme" we find staircases without direct air and ventilation, and with bends and turns anything but re-assuring, and the paragraph ends by designating a theatre built at the present day in this plan will be an anachronism.

Permit me, Sir, as the designer of the proposed theatre, to state that the writer of the above has written in entire ignorance upon the particular defaults mentioned, inasmuch as each staircase has both direct air and ventilation, and that the bends and turns are simplicity itself.

I cannot complain of the writer's ignorance, seeing that he had but the ground floor plan and the Haymarket elevation to guide him, but I do complain that from such inadequate, bare outlines anyone shall presume to designate a whole work as an anachronism.

I shall have pleasure in showing to your representative the whole of the drawings, if you will favour me by letting him call here.

With reference to the comments upon the London County Council and its duties, I say nothing, as the whole matter is still "sub-judice," but I have not the slightest fear about the London County Council faithfully fulfilling its functions.

WALTER EMDEN.

*** The proposed theatre is an anachronism when compared with any modern Continental opera-house built within the last twenty years. It has obviously been planned too much from a financial and too little from a theatre point of view. The staircases we referred to are the two "first circle" staircases, and the principal stage staircases. These may, it is true, be lighted from some small area not carried down to the ground, or from a top-light, but the modern idea of what is requisite for theatre-stairs is that they should be lighted by windows looking into a thoroughfare or into a large open space.—ED.

SHOREDITCH BATHS AND LIBRARY COMPETITION.

SIR,—I enclose, for publication, the Assessor's Report, and I wish to call the attention of your readers to the curious fact that Mr. Rowland Plumbe shifts the whole of the responsibility as to whether the premiated designs do, or do not, comply with the conditions of the competition, on to the shoulders of the Commissioners, although one would naturally suppose that he was appointed for the express purpose of determining that question.

The appointment of a District Surveyor as Assessor should at least have been a guarantee that the conditions relating to the use of the large Bath as a Public Hall would be strictly enforced; yet, judging by the designs selected, one is led to the conclusion that the Assessor has never even read Section LXXX. of the London Building Act, 1894.

Unfortunately, in most competitions the competitors have no voice in the selection of an Assessor.

ERNEST HERBERT.

*** The printed letter of the Assessor, giving his award, is as follows:—

"13, Fitzroy-square, London, W.,
November 26, 1895.

COMPETITION DESIGNS FOR NEW BUILDINGS.

To the CHAIRMAN AND COMMISSIONERS OF BATHS AND WASH-HOUSES, &c., *and to the* CHAIRMAN AND COMMISSIONERS OF THE PUBLIC LIBRARIES FOR THE PARISH OF ST. LEONARD, SHOREDITCH.

GENTLEMEN,—I beg to inform you that I have most carefully examined the thirty-five designs submitted in competition for your proposed new buildings.

After long consideration of the various designs in every detail, and judging, to the best of my ability, their various merits and defects, I beg to report that, *subject to the conditions of competition*:—*

I place as FIRST in order of merit, the design NUMBERED 13.

I place as SECOND in order of merit, the design NUMBERED 32.

And I place as THIRD in order of merit, the design NUMBERED 30.

I am, Gentlemen, Yours very faithfully,
(Signed) ROWLAND PLUMBE."

This certainly seems to us a rather curious way of "assessing" a competition.—ED.

CONCRETE AND IRON CONSTRUCTION.

SIR,—In your issue of September 21, 1895, Mr. Edwards publishes a letter that I think should not be passed over in silence. He claims:—

First, that he discovered the fact that, with bars long in proportion to their sectional area, a point can be reached at which the bars will fail by tearing before they can be drawn out of the concrete.

The principle of this discovery, as well as its practical application, may be found exemplified in the work of Major-General Sir C. W. Pasley, K.C.B., published in 1847.

I remember also, if I mistake not, some mention of this subject in your long-established journal of about date 1852.

Be this as it may, as early as 1874, availing myself of the current knowledge of the subject, I used such iron in concrete-iron construction, nor in so doing, did I consider my work as being in any way exceptional. It seemed one of those facts by nature so obvious as to hardly escape the notice of any thoughtful mind.

I do not deny Mr. Edwards may have made the discovery he claims, but, if he did, then Rip-Van-Winkle-like, he slept whilst the world moved on about him.

The difficulty in the use of plain, round, or square bars in concrete iron-construction is not that they pull out of the concrete, but that they stretch within it. This is, I think, exemplified in Mr. Edwards' specification (No. 2,941, page 3), where, under strain, out of eleven sample beams tested, seven cracked on the bottom. If the iron did not stretch, why did the concrete crack?

The egotistical assumption that I was unable to design my beams with any degree of certainty until after the publication of his experiments and calculations, would imply that the several large works erected by me up to that time, were of doubtful stability. The contrary is the fact. Thus far they have in every case stood the three-fold test of direct maximum weight, of earthquake, and of time. Of a piece with the above is his assertion that the general circular issued by our firm bears evidence that we have studied his specifications. Which edition does he refer to? and will he kindly point out said evidence. He states it is only through his experiments, &c., that concrete-iron beams can be accurately designed, Truly, if his experiments are as accurate as his statements—and there should be truth in this last assertion of his—concrete-iron construction is in a bad way.

Will Mr. Edwards state why he corrugates the ends of his rods.

A fair and candid mind, in stating that I had not patented my invention in England, would have added that I had patented there the cold twisting of iron, which is the most practical method of twisting iron for concrete iron construction.

Mr. Edwards winds up with the following pretentious nonsense:—"I should certainly consider the use of twisted square rods to form concrete and iron beams an infringement of my patents." How, let me ask, can a method of construction in use in America for seven years be an infringement upon an English patent taken out after that time, seeing that the American device was promptly patented, and published widely? And as he lays no claim to the twisting of the rods, his bombastic utterance would include the use of untwisted square rods, a use that has been open to the public for fifteen or twenty years, and which was patented by Scott in 1867 in England. ERNEST L. RANSOME.

* The italics are ours.

A NEW CHANCE FOR A LIVELIHOOD.

SIR,—Quite a number of misanthropical pessimists are periodically inflicting upon their fellow men, through the agency of the Press, spasmodic enquiries as to "what to do with our boys?" a query at present but imperfectly and unsatisfactorily resolved.

An advertisement which is appearing in the columns of a daily contemporary of yours, addressed to "architects or clerks of works," whereby "Architect" makes known his desire to secure the services of a member of one or other *métier* (no matter which) goes some way towards the solution of the above problem. No need for "our boys" to emigrate, let them immediately prepare to become "architects or clerks of works," it does not matter which, at least "Architect" does not apparently draw any distinction between the two occupations; providing the candidate can "*make out* (*sic*) specifications"—*par parenthèse*, can any of your readers "*make out*" "Architect"?—and "thoroughly understands decorating, drain-work, and the building trade generally;" he can, if declared by "Architect" to be the successful competitor, earn a weekly wage of fifty shillings.

Let parents and guardians cease from their vague inquisitions, and as soon as the boy's education is satisfactorily accomplished, at once plank down the money required as premiums for articles or indentures, and make due preparation for their charges' support in accordance with their relative positions in life, for a term of years; at the end of which period, if the experience required by "Architect" has been gained, they will then be in the proud position of being duly qualified to take their chance in competing for a prize of the above weekly value.

Architects and clerks of works of the present day must be on the alert if they would keep an outsider from securing this lucrative appointment.

J. GILLING,

*** The following is the advertisment referred to by our correspondent:—

"Architect or Clerk of Works Wanted. Must be able to make out specifications and thoroughly understand decorating, drain-work, and the building trade generally. Wage 50s. weekly. Address, stating full particulars, references, &c., Architect, care of * * *"

The Student's Column.

CARPENTRY AND JOINERY.—I.

PRELIMINARY.

IT is proposed to treat the important subjects of Carpentry and Joinery in this column under the following headings:—

1. Various woods in use and their characteristics.
2. Preparation, seasoning, and conversion of timber into scantlings.
3. The various tools used by the carpenter and joiner.
4. Joints used in carpentry.
5. The various forms of roofs, and trusses used in their construction.
6. Trusses used in bridges and other heavy works.
7. Shoring and strutting.
8. The various forms of centreing for different arches, &c.
9. Scaffolding, and its economic distribution.
10. Beams and girders: their construction and form.
11. Floors: the various types, including trimming round voids.
12. Partitions: various kinds used for different purposes.
13. Joints used in joinery.
14. The mouldings used in joinery and their method of application.
15. Doors, their several forms as framed, moulded, &c.
16. Windows, sashes, casements, and other varieties.
17. Framing: as spandrel, fittings, &c.
18. Skylights and lanterns, for various positions.
19. Stairs: construction and forms suited to different positions.
20. Shaped work as used in joinery.
21. Rods: the methods of setting out joinery.
22. Bevels.
23. Hints on workshop practice.

The subject will be treated as fully as possible, having regard to the space at our disposal, and will be illustrated where possible, in order that the student may grasp the meaning of the context as easily and as quickly as may be.

Various woods in use and their characteristics.

The following are the principal soft woods in general use:—*Northern pine* (*Pinus sylvestris*), is commonly known as yellow deal, and is in general use for all building purposes. The best varieties come from Dantzig, Memel, Riga, and Archangel; the inferior kinds from Scotland, Sweden, and Norway. The wood is easily worked, and is tough, elastic, and moderately light; it is used for joists, flooring, roofs, sash-frames, and scaffolding, &c.; it shrinks from one-twentieth to one-thirtieth in the process of seasoning, and the annual rings should not be more than one-eighth of an inch thick. Inferior kinds have thick rings filled with resinous matter. The weight is about 32 lbs. per cubic foot.

Spruce (*abies excelsa*) is commonly called white deal; it is used for cheap buildings where not exposed to the weather, and is much used for the tops of dressers and for shelves, and also for scaffold-poles, and comes from the north of Europe, that from Christiania being the best. It is liable to warp, twist, and shrink, and is knotty and, therefore, hard to work. There are several varieties of American spruce (*abies alba*) now on the market, though these as a rule are inferior to the above.

American yellow pine (*pinus strobus*), sometimes known as Weymouth pine, because introduced by Lord Weymouth, is inferior in strength to Baltic timber and very subject to dry rot. It can always be distinguished by the hair-like short streaks running in the direction of the fibres. It is used by joiners and cabinet makers. Its specific gravity is about 35 lbs. per foot cube, or about 3 lbs. more than northern pine.

Canadian red pine (*pinus rubra*) is so called from the colour of its bark. It is used for internal fittings, is tough, elastic, clean and fine in grain, and very durable where air has free access.

Kauri pine (*Dammara Australis*) is used for joinery, and is the strongest pine known. It is a yellowish white wood which planes up with a silky lustre and fine close grain. It is used largely for yacht masts. It comes only from New Zealand, and averages about 36 lbs. per cubic foot.

The following are the principal hard woods in use:—

Pitch-pine (*pinus rigida*) is used for the best structural purposes; it is an excellent wood for joinery, but it has great specific gravity, and the difficulty in working it entails expense in its use. Pitch-pine comes principally from Virginia. It is liable to cup and heart shake (see next article).

Oak is the strongest and most durable wood for ordinary building purposes. It has distinct medullary rays, and shrinks about one-thirtieth of its width in seasoning. Owing to the presence of gallic acid in its composition it causes iron fastenings to corrode. English oak is taken as the standard of quality for all woods, and weighs about 48 lbs. per cubic foot.

Austrian and German Oak is very hard and tough, and is largely used, and is specially cultivated in large forests.

American oak is one of the best foreign oaks, being but slightly inferior to English. Riga oak is commonly called wainscot oak (although the latter is a term often used to indicate any oak cut along the medullary rays so as to show the silver grain); it has fine, highly-figured silver grain, is used for panelling and for the very best joinery. "Crown Riga" is the best quality.

African oak is known as the link between teak and oak. It is shipped from Sierra Leone, and is mostly used for ships. It is of a dark reddish colour, free from defects, but difficult to work owing to its close grain. It is one-third stronger than English oak, and weighs about 57 lbs. per cubic foot.

Chestnut was much used for roofs and other carpenters' work in the Middle Ages, but is now not much used except for posts and palings. It resembles oak in appearance, but is slightly darker in colour, and has no medullary rays and no sap-wood. It is easier to work than oak, but not so strong, and liable to give way under a cross strain. The tree itself is one of the largest grown in Europe, and lives to a great age, though when old it is very brittle. Chestnut is imported also from Africa and North America.

Mahogany is generally used for handrailing, ornamental joinery, and cabinet work; as it will not stand the weather it should not be used for external work. That which is shipped from Cuba (called *Spanish mahogany*) is, as a rule, sound and free from defects, but its pores contain a white chalky substance, which dulls the edge of the plane, and makes it harder to work than the other species; it has a fine wavy grain and takes a very high polish. It weighs about 64 lbs. per cubic foot.

Honduras mahogany, from Central America, is a stronger wood than Spanish, and has a transverse strength very nearly equal to British oak. It is largely used for panelling and fascia boards, owing to its immunity from warping. It is not usually attacked by worms or insects, but requires great care, as if seasoned too rapidly it is subject to large strakes. It has a clear straight grain. Inferior qualities may be detected by the appearance of grey specks.

Mexican Mahogany has some of the characteristics of Honduras, but is usually obtainable in larger sizes; it is considered liable to star shakes, and though it is a good wood for joinery, it is not equal to Honduras or Cuban.

Yarrah (or Jarrah), sometimes called Australian mahogany, is a species of gum tree from Western Australia. It is of a dark red colour, and has a close wavy grain; it is durable and rigid. It is, however, deficient in tenacity and in seasoning; narrow cracks of great depth are sometimes formed. It is well adapted for piers, piles, and other heavy work, and has of late years been much used with some success for paving roads in the form of small longitudinal blocks.

Teak, sometimes called Indian oak, comes from Burmah and Southern India. It is straight in grain, and of a warm brown colour; it somewhat resembles English oak, but has no medullary rays. It is light and easy to work, and possesses an aromatic resinous oil, which not only makes it durable, but enables it to resist the attacks of worms and insects. If the oil has collected into the strakes and hardened, it destroys the tools and is hard to work; this oil, however, preserves iron from rust, and thus teak is much used for backing to armour-plates and in railway contracts. The species which is shipped from Moulmein, in Burmah, is generally considered the best, and weighs about 47 lbs. per cubic foot; that from Malabar, however, is preferred by some.

Greenheart is the strongest wood in use. It comes principally from Demerara and British Guiana. It has a fine, hard, and close grain, is of a dark chestnut colour, is full of minute pores, and the sap wood is difficult to distinguish from the heart. It is one of the least fire-resisting of all hard woods, and is liable to split at the ends in seasoning. It is much used for piles and marine structures. Greenheart is the heaviest wood in use, and weighs nearly 70 lbs. per cubic foot.

Ash combines elasticity and toughness to a remarkable degree, and should be used in any work that is subject to shock or strain exerted suddenly. It is of a brownish white colour with yellow streaks in the direction of the grain, with very distinct pores. It has no sap-wood, and is used more by the wheelwright than by the carpenter. The variety grown in England is considered the best, though that from America and Canada is largely imported for the manufacture of oars, &c. Good specimens weigh about 50 lbs. per cubic foot.

Elm is twisted in the grain, and is of a reddish-brown colour. It is very durable in either wet or dry situations, but lasts but a short time under varying conditions. It is not liable to split, and takes nails well. When Old London Bridge was demolished, the elm piles, which were some hundred years old, were found to be in a sound condition. The sap-wood withstands decay as well as the heart. The best varieties are grown in England, France, and Spain. Dutch elm is very inferior. A variety known as Wych elm is grown in Scotland and the north of England, and is much used for boat-building. Canada also supplies elm of a whitish brown colour, but the sap-wood is liable to decay. The best elm weighs about 42 lbs. per cubic foot.

Walnut is of a varying brownish tinge. The Italian variety is much prized by the cabinet-maker. English walnut, and specially that shipped from America, is used for window frames and sashes, doors, and the best class of joinery, also for gun-stocks (as it contains no oil that will affect metal) and veneers, but it is too flexible for constructive work. It weighs from 41 to 43 lbs. per cubic foot.

Beech has a hard clean surface and fine even grain, and is not difficult to work. It is used for mallets, planes, piles, and chair-making, and has such a remarkable cleavage that it is used for band-boxes and sword-scabbards. Besides being grown in England, it is found in the temperate parts of Europe, America, and Australasia. It weighs about 45 lbs. per cubic foot.

Amongst other woods seldom used by the carpenter and joiner are *hornbeam* which has no sap-wood, and is used for turning and mallets; *birch* and *cedar* which are used principally for furniture; *acacia*, from which good trenails, posts, and railings are made; *poplar*, which is used for light purposes, and stands the weather well; *American plane*, which is hard to work but is durable under water; *larch*, which is well suited for floorboards and stairs, and also posts, railings, and scaffold-poles, where there is much wear; and, lastly, *alder*, which is occasionally used for turnery and cabinet-work, and is, moreover, extremely durable under water. The buildings of the City of Ravenna are built on piles made of this wood, as are also the abutments of the Rialto Bridge at Venice.

OBITUARY.

MR. JOSEPH SHIELDS.—We regret to announce the death of Mr. Joseph Shields, architect, Sunderland, who died on the 22nd ult. at Edentown, Carlisle. Mr. Shields was a well-known Primitive Methodist, and had erected a large number of churches and schools for that body in the North of England. He was recently appointed architect for the Sunderland Union Infirmary, which he won in competition. Mr. Shields was a member of the Northern Architectural Association.

M. AUNE.—The local Architectural Association of South-East France has lost one of its oldest members by the death of M. Aune, at the age of 75. M. Aune was born near Nice, and received his education at Turin. He subsequently entered into the official architectural service at Nice, in which he passed his whole professional life. His most important work was the Théâtre de l'Opera at that town.

M. H. FRŒLICHER.—We have to record the death of another French architect, M. Frœlicher, at the age of 70. Among his numerous works was the re-construction of the Château of Bonnelle, for the Duchesse d'Uzès, and the restoration of the Château of Videville near Poissy.

GENERAL BUILDING NEWS.

LABORATORY BUILDINGS FOR THE INLAND REVENUE.—A new laboratory is in course of construction for the Inland Revenue. Mr. B. E. Nightingale is building it from the design of Mr. John Taylor, C.B., of Her Majesty's Office of Works. The floors are to be fireproof on the Mark Fawcett system.

NEW THEATRE FOR BATTERSEA.—The plans for the new Shakespeare Theatre, near the fine Municipal Buildings at Lavender Hill, Clapham Junction, have now received the approval of the London County Council and the Battersea Vestry authorities. The site, as it is now formed, is a very advantageous one, though in order to comply fully with the London County Council's regulations, it was necessary to form an entirely new side road, which is named after the building. The main frontage of 60 ft. in Lavender Hill, and return frontage, will be of Classic character, and executed in stone. The theatre will be what is known as a two-tier house, viz, stalls and pit on the ground-floor tier, dress-circle and balcony on the first tier, gallery and amphitheatre on the second tier, and the usual private boxes. The approach for the stalls, dress-circle, balcony, and private boxes will be from Lavender Hill, into a richly-decorated vestibule and crush-room, and from here, by short and easy stairs and slopes, direct to each separate part of the house. The pit and gallery entrances will be from "Theatre Road." Abundant emergency exits are provided from every part, and the theatre will be constructed entirely of concrete and steel. As usual, in theatres of recent date, there will be no columns to impede sight. The decorations of the auditorium, vestibule, crush-room, and lounges will be of Moorish character with upholstery of silk, velvet, and plush. The house will be lighted by electric light supplied from the proprietor's own plant. The stage will have a clear width of 70 ft., and a depth of 50 ft., and a height of 55 ft. to the grid. The dressing-rooms will be arranged with every regard to ventilation and sanitation, and will be provided with hot and cold water supplies and be heated, and will stand as a separate block, cut off by brick walls and iron-doors from the stage. A perfect system of low-pressure hot-water pipes and radiators will be provided throughout the building, and the stage and auditorium will be separated by a fire-proof curtain and dominated with a complete system of hydrants. The theatre will cover a superficial area of 14,000 square feet, at a cost of 25,000*l.*, including the necessary alterations to the site. Mr. W. G. R. Sprague, of London, is the architect. It is intended to have the house ready for opening on next August Bank Holiday.

DUNDEE BUILDING TRADE IN 1895.—From the point of view of the builder, says a Dundee contemporary, the year just closed has been, on the whole, very satisfactory. Succeeding an unusually brisk twelvemonth, the prosperity of that period has been continued during the whole year. At length, however, there are indications that the building "boom" which has been in full swing these three or four years has well-nigh spent itself, and will not survive Whitsunday next. The property market has been over-stocked, and many new tenements are

sadly lacking in tenants. While the construction of dwelling-houses has thus been responsible, in large measure, for the briskness of the trade during the year, building operations on more extensive lines have been in progress. A beginning has been made to a number of structures which, when completed, will rank among the finest architectural features of the city; several important works begun last year, but still in process of construction, have been advanced towards completion; while invaluable work has been done by the Sanitary Department of the Town Council among the buildings in the poorest quarters of Dundee. During the past year this branch of the Council's work has been prosecuted with greater vigour than ever before, with the result that slum after slum has been completely transformed either by the thorough renovation of the old properties or their demolition and reconstruction. An important crusade has also been carried on against the condition of dairies and cowsheds in the city. It is required by the regulations that each animal in a cowshed shall have 800 cubic feet of air space. This regulation is now being strictly enforced, so that, in the course of the year, enlargements have had to be carried out on many premises of this description, while others have been entirely rebuilt. This vast amount of building has kept tradesmen fully employed during the year. Indeed, builders have had difficulty in securing masons, the number of those in the city being scarcely adequate for the requirements of the past few years. Then there exists no inducement for hewers and builders to come to Dundee from other centres, for building has been brisk over the whole country, and there is nothing to be gained here so far as remuneration is concerned. In the course of the year the masons secured an improvement in this respect, the wages of hewers being advanced from 8d. to 8½d. per hour, and those of builders from 8½d. to 9d. per hour. Kindred tradesmen—joiners, plasterers, painters, slaters, plumbers, &c.—have also been well employed. Of the large buildings begun in 1894, but completed in the course of the past twelve months, the most important were the Lochee Free Library and Public Baths, which were opened by Lord Provost Sir James Low early in December, and the little church erected for the Ward-road Baptist congregation.

ALTERATIONS TO BROCKENHURST CHURCH, HAMPSHIRE.—The parish church of Brockenhurst, which has been closed for alterations and repairs, was re-opened on the 22nd ult. The old high pews, facing in all directions, which were erected 62 years ago, when the church was enlarged, have now given place to more comfortable and convenient sittings. A new floor of wooden blocks laid on concrete, and a new warming apparatus, have also been provided. The work has been carried out under the supervision of Sir. A. Blomfield.

PARISH CHURCH, TROON, AYRSHIRE. A new parish church has just been opened at Troon. The church is thirteenth-century Gothic in style, from designs by Mr. Hippolyte J. Blanc, A.R.S.A., architect, Edinburgh, and the memorial stone of the building was laid rather more than two years ago by the Duke and Duchess of Portland. On that occasion the fabric was described in the *Builder* for Nov. 18, 1893. A feature of the church is the pulpit, also designed by Mr. Blanc, and executed by Messrs. Wylie & Lochhead (Limited), Glasgow. It is a somewhat later phase of Gothic than the building.

CO-OPERATIVE SOCIETY'S NEW CENTRAL PREMISES, LEIGH.—The Leigh (Lancashire) Co-operative Society about a month since invited designs for their proposed central premises from Mr. Fred. Smith, architect, of Manchester, and from Mr. J. C. Prestwich, architect, of Leigh, agreeing to give an honorarium to the unsuccessful competitor. The Committee of Management selected the design submitted by Mr. Prestwich, and it is intended to at once clear the site of the existing buildings, and proceed with the erection of the new premises, which comprise eight departmental shops. In addition to these, and on the first floor, are spacious reading-room, library and educational committee rooms, ladies' and gentlemen's hat and cloak rooms in communication with an Assembly Hall, seating 1,200 persons. Arranged *en suite* with the large hall, is a second hall seating 400, intended for the smaller meetings of the Society. A number of ante-rooms, dressing-rooms, and a supper-room are grouped round the two halls, available for use in connexion with either hall. Work-rooms will be provided for boot and shoemakers, and tailors, milliners, and dressmakers. The several departments will be fitted with lifts, worked by electric motors from a cable already laid, and the premises will be electric-lighted throughout. The architect's estimated cost is 16,400*l*. The architectural treatment is Flemish Renaissance, terra-cotta being largely used, with stone for the piers of the shop-fronts and other points of support, as being better adapted to bear the superincumbent weight.

BUILDING TRADE IN INVERNESS.—During the past year the building trade in Inverness has proved exceptionally busy. It is estimated that the value of the buildings erected amounts to upwards of 70,000*l*. In the centre of the town, many improvements have been effected. On the whole, with the exception of two months in the first part of the year, when the weather was extremely stormy, builders have had an active period of work throughout the whole year. The construction of the new iron bridge over the Ness at a cost of 5,000*l*. is an undertaking which is now nearing completion.

KIRKCALDY SWAN MEMORIAL BUILDINGS.—On the 23rd ult. the buildings which have been erected under the auspices of the Young Men's Christian Association, on a site facing High-street and Kirk Wynd, in memory of Provost Swan, were opened at Kirkcaldy, from plans prepared by Mr. G. Washington Browne, architect, Edinburgh. The buildings, of red stone from Dumfriesshire, rise to a height of three stories. There are lecture-hall, reading-room, library, gymnasium, &c., the total cost of the undertaking being about 5,000*l*.

RECONSTRUCTION OF GLASGOW CORN EXCHANGE.—The Corn Exchange, Glasgow, which has been under process of reconstruction, is now all but completed. The building was designed by Mr. William F. M'Gibbon, Glasgow, and constructed of red sandstone from Locharbriggs Quarries. The frontage to Hope-street and return to Waterloo-street is four stories in height. The Hope-street frontage is divided into five divisions by engaged columns. Of the five divisions the central feature is the doorway. It has columns in advance of the plane of wall connected by the cube blocks to main pilasters, the ingo of the door being of rustic masonry, having a semi-circular archway with large cavetto moulding on arris. This doorway leads to the Exchange proper, as also to the upper stories, connected by a staircase 14 ft. wide. Surmounting the door columns are colossal figures representing sowing and reaping, from the studio of Mr. James Young, sculptor. The erection of the buildings has been carried through by Messrs. P. & W. Anderson, Glasgow.

RENOVATION OF WESLEYAN CHAPEL, TIVERTON.—For some months past works of enlargement and renovation have been in progress at Tiverton Wesleyan Chapel. Two houses, for the minister and chapel-keeper, and which partly obscured the front view of the chapel, have been removed. The old wooden porch has given place to a new portico. A chancel has been erected, the gallery set back, the old unsightly rostrum replaced by a pulpit, and the building renovated throughout. The designs were prepared by Mr. James Crocker, of Exeter, and Messrs. Deering & Son carried out the work.

ST. BARTHOLOMEW'S CHURCH, IPSWICH.—The consecration has just taken place of St. Bartholomew's Church, Ipswich. Mr. Charles Spooner, Queen Anne's Gate, London, was the architect, and Mr. S. C. Parmenter, Braintree, has been the contractor. Up to the present the amount expended has been about 5,000*l*., and the portion of the church at present completed affords seating for about 500 persons. When finished it will consist of nave, with north and south aisles, chancel, morning chapel or south chancel aisle, with priest's vestry and ambulatory, and sacristy, with a tower 81 ft. high at the north-east corner of the nave; but up to the present the completed portion consists of the chancel, and the greater part of the nave and aisles, one bay remaining to be added at the west end hereafter. The eventual dimensions are intended to be:—length, 162 ft., width, 62 ft.; the length of the completed portion is, chancel 39 ft., nave 75 ft., leaving 48 ft. to be added to the west end of the nave. The material used is red brick, with Bath stone dressings, and the roof, which is high-pitched, there being no clearstory, is tiled. When finished the nave will be mainly lighted by a large window in the west wall. The stone piers of the nave are octagonal. Above the arcade is a wide plaster frieze, and it is proposed that at a future time this should be decorated with ecclesiastical paintings. The roof, which rises to a height of 50 ft., is of open timber work. The walls are rough plastered; the floor is of pitch-pine blocks. Another contemplated addition is a chancel-screen and rood-screen above, running up to the tie beam of the roof. The chancel is raised 21 in. above the level of the nave, and is approached by three steps, whilst another step divides the sanctuary from the chancel. The floor of the sanctuary is of brown and white Ancaster stone. The chancel is lighted by a pair of clearstory windows in the sanctuary and a large rose window in the east wall, placed high up so as to leave space below for the altar. This will eventually be filled with stained glass, designed by Mr. Christopher Whall, London. The morning chapel will be added later, with the ambulatory or passage behind the altar between the priest's vestry and the sacristy. The altar and re-table are of carved sequoia wood, whilst above are suspended richly-coloured hangings supplied by Messrs. Wm. Morris & Co., London. The altar-cross was made by Mr. Richard Rathbone, Menai Bridge, and is of hammered-brass. Among others of the gifts is the font, of green marble and alabaster, a block of marble, with four projecting pillars, being used for the pedestal, whilst the alabaster forms an octagonal basin. The pulpit will be similar in design to the font, its material being Irish marble.

THE BUILDING TRADE IN STIRLING IN 1895.—The year just closed has been a very prosperous one in the Stirling building trade, and the prospects for 1896 are particularly bright. The most important addition to public buildings during the year has been the new Post Office, which was opened on the 24th of May.

SANITARY AND ENGINEERING NEWS.

ADMIRALTY PIER AT DOVER.—The existing lighthouse on this pier, coloured red, situate on the south side of the turret at the end of the Admiralty Pier, has been removed, and a new lighthouse built on the north-western angle of the fort carrying the iron turret at the end of the pier; this is of granite, and is surmounted with a lantern. The height of the stone tower of the new lighthouse is 23 ft. 3 in., and the light is a white fixed dioptric light, of 360 deg. horizontal range, with flashes at intervals of 7½ seconds. The arrangements have been designed by Mr. A. T. Walmisley, the Engineer of Dover Harbour, and the lantern supplied and fixed by Messrs. Chance Brothers, of Birmingham.

HARBOUR EXTENSION AT WHITEHILLS, BANFF.—It is stated that the application of the Harbour Commissioners of Whitehills to the Fishery Board for a grant in aid for the construction of the new harbour has been granted. The Board at a recent meeting resolved to proceed with the construction of the harbour in accordance with plans prepared by Messrs. Stevenson, Edinburgh, at an estimated cost of 10,000*l*., on condition that a local contribution of 3,000*l*. be given.

STAINED GLASS AND DECORATION.

WINDOW, ST. PAUL'S CHURCH, BURTON-ON-TRENT.—It is intended to place a new east window in the chancel of St. Paul's Church, Burton-on-Trent. The window chosen is designed by Mr. G. F. Bodley, A.R.A. It consists of large single figures of early English Saints, and in the centre is the Holy Child in His mother's arms, surmounted by our Lord enthroned in glory and encircled by the members of the angelic host.

MEMORIAL STATUE, ST. MAGNUS' CATHEDRAL, KIRKWALL.—The memorial to the late Dr. Rae was unveiled in St. Magnus' Cathedral, Kirkwall, recently, by Colonel Balfour, the Convener of Orkney. The design and execution of the memorial was by Mr. Joseph Whitehead, of London. The base of the memorial is of Aberdeen granite, the pedestal of Peterhead granite, and the figure of Portland stone.

FOREIGN.

FRANCE.—M. Roty, the Medallist, has been elected Vice-President of the Académie des Beaux-Arts, in place of M. Bonnat, who has been elected President.——M. Paul Boeswilwald, the architect, has been appointed Inspecteur-général in the Department of "Monuments Historiques," in place of his father, M. Emil Boeswilwald, who has retired. ——A group of artists, among whom M. Puvis de Chavannes, M. Detaille, and M. Bouguereau take the lead, has been formed with the purpose of creating a syndicate for the protection of artists in regard to the right of reproduction of their works.——The prize entitled "Reconnaissance des Architectes Americains" has been awarded to M. Chifflot, a pupil of MM. Daumet and Esquié. The subject was "A Monument to Washington."——The Académie des Beaux-Arts has given, as the subject for the Achille Leclère Competition in Architectural Design for this year, "The Entrance Gateway of a Capital City."——It is proposed to make important modifications in the Chamber of Deputies. The scheme, of which the cost will be about four million francs, includes the construction of a new Salle des Séances in the main court, facing the Place du Palais Bourbon, and the installation of electric lighting in the building. There will be no competition, as the work will be carried out by the official architect, in accordance with plans prepared by the late M. Joly.——The Union Artistique du Nord will open an exhibition of paintings at Lille, from the 15th of March to the 15th of May.——The new buildings for the Faculté de Droit and the Faculté des Lettres, at Lyons, will be opened during the early half of the present month.——The Municipal Council of Paris has voted for the execution of an aqueduct for the long-proposed conducting of the waters of the Loing and the Lunain to Paris. The cost is estimated at between 18,000,000 and 19,000,000 francs. ——A monument has been inaugurated at Poitiers to the memory of natives of that town who fell in the Franco-German war. The monument, which is in granite and marble, is designed by M. Formigé. The pedestal carries a statue of a wounded soldier, by M. Coutan. ——A Hôtel de Ville on a large scale is shortly to be commenced at Niort, at a cost of more than a million francs.——A large glass hall or winter garden is to be constructed in connexion with the baths establishment at Bagnères-Luchon.——Two new squares have been made at Paris, one on the Boulevard Magenta, near the Church of St. Laurent, the other at the Place Denfert-Rochereau. In this latter is to be a pavilion which is to form an entry to the Paris catacombs.——The Conseil-Général of the Seine has entrusted M. Victor Prouvé with the decoration of the main staircase in the new Mairie of Issy-les-Moulineaux. M. Henri Carot has been commissioned to execute a large stained-glass window for the Mairie at Perreux, and M. Arus to paint a landscape with figures at the Mairie of Alfortville. The Conseil-Général has also

voted the erection of a monument to Delacroix at Saint-Maurice, the architectural portion of which will be designed by M. Jacques Lequeux.——A Greek church has just been opened at Paris, situated in Rue Bizet, and built at the cost of M. Stefanovich Schilizzi. This fine building is the design of M. Vaudremer. The interior walls have been decorated by M. Chas. Lameire, and the Iconostasis, in marble, by M. Ludwig Thiersch, who has already executed some paintings on the Iconostasis of the Greek church in London. The church has cost three million francs.

GERMANY.—At Hamburg Professor Otzen, of Berlin, has been reading a paper on modern church architecture with special reference to the new Friedenskirche, which has been erected from his plans in the neighbouring town of Altona. The paper was very well received, especially on account of the numerous practical suggestions given by the Professor. The church described has 800 seats, and cost 351,000 marks, or about 17,500*l.* Like several other new churches in Germany, it is lighted by incandescent electric light. —— The proposed museum at Hanover, which has been the subject of a competition, is now to be carried out, Professor Stier, of Hanover, who obtained the first premium, being the architect.——A competition for the design for a new railway-bridge over the River Rhine, near Worms, has been opened, and some large premiums, including one of 500*l.*, are offered. The bridge is to cost 140,000*l.* An influential jury will make the award.——The German Embassy at Rome has its home in the Palazzo Caffarelli, which was bought in 1854. The large banqueting-hall is now to be restored under the supervision of Professor Alfred Messel, and the German Government has been asked to vote 2,000*l.* for this purpose, whilst the Emperor has promised 4,000*l.* towards the fresco and plastic decoration, as a contribution from his Privy Purse.——The new "Oberbaum" bridge over the Spree, which replaces a structure dating from 1724, is now nearly completed. The work has been carried out very rapidly, scarcely taking a year, some 500 to 600 men being employed during the greater part of the operations.——According to the *Deutsche Bauzeitung*, the Municipality of Berlin had to spend about 42,000*l.* last year for extra scavenging during the snowstorms, and there is some thought of improving the arrangement for quick clearance by having special ducts or sewers built to take the snow into the river, instead of having to rely on a system of carting.——Duisburg is to have a new town hall, and a competition has been opened for the design. The cost is limited to 25,000*l.*, and the premiums are respectively 350*l.*, 250*l.*, and 150*l.* An influential committee, including Professors Ende and Thiersch as architects, will act as assessors. ——The long-expected revised Building Act for Munich has now been published. It contains numerous clauses which are amusing reading for English architects. In the case of new structures or alterations to old buildings, the architectural treatment must accord with the æsthetic requirements of the authorities. Houses must not be painted a brilliant white colour, as this is injurious to sensitive eyes.——Besides the usual estimates for ordinary repair and extensions, the Budget for the Kingdom of Saxony, which has been put before the Diet at Dresden, includes a special estimate of about 3,400,000*l.* for new works. The principal item is 700,000*l.* towards the new Central Railway Station at Dresden, this sum being the fourth payment on account. New Law Courts in the minor towns require 100,000*l.*, and a new Weights and Measures Office, some new Technical Schools, and the Technical College at Dresden, will require substantial sums. The remodelling of the lecture-room at Leipzig University, which is being gradually carried out, again requires about 100,000*l.* Extensions to the Saxon railways will cost about 400,000*l.*——Messrs. Vollmer & Jassoy, of the Royal Technical College at Berlin, who were successful in the great Stuttgart Town Hall Competition, have now been instructed to revise their plans, and will probably receive the commission for this important building.——The official notification of the proposed International Art Exhibition, at Dresden, has now been issued. The exhibition, which will be held from May to October, 1897, is to consist of collections of works from different countries, and to comprise works of painting, sculpture, and architecture, and of the delineating and multiplying arts which have been produced during the last ten years.—— The palatial mansion of the Duke of Stolberg at Berlin, is to be adapted for the purposes of a social club somewhat on the same lines as the London Grosvenor Club.

AUSTRIA.—Our Austrian contemporary, *Monatschrift fuer dem Oeffentlichen Baudienst*, publishes a valuable description of Butschowitz Castle, in Maehren, from the pen of Herr Abois Franz.—— The new bridge over the Danube, near Stein, which replaces the old Jochbrucke, has now been completed, the works only having required a year and nine months. The cost has been nearly 765,000 florins, or 63,750*l.* An official from the Government Board of Works, Herr Leopold Woeck, is responsible for the design.——The Church of St. Leonard, in the Lavant Valley, which is well known to tourists, has now been thoroughly renovated after the unfortunate fire which was caused by lightning in 1884; but funds were not available for the erection of a new spire, for which the late architect, Schmidt, had already prepared drawings. The money is now being raised by voluntary contributions, and as soon as 16 000 florins are collected a start will be made. ——The new municipal savings bank, which has been completed at Reichenberg, shows some excellent planning and very successful freestone façades in the Italian Renaissance style. The architects are Messrs. Miksh and Niedzelski.—— From Bucharest news has been received of a disastrous fire in the new Théâtre Lyrique, and the building is reported to have practically been gutted. The neighbouring old Law Courts were also destroyed, but fortunately the contents had already been removed to the new building which has lately been completed.——The Municipal Budget for Vienna does not show any unusual items. The school buildings fund will, however, amount to over 1,240,000 florins, and the extension of the sewers requires 529,000 florins. The estimate for pavements is nearly 1,000,000 florins, and improvements to the water service 2,500,000 florins, or about 200,000*l.*——Extensive additions and alterations are contemplated at the Vienna Municipal warehouses, and an officer of the City Office of Works has been sent on a tour of inspection prior to advising Dr. Friebeis as to the improvements necessary.——Owing to the numerous monuments which are being erected in memory of deceased artists and scientists, there is now some feeling at Vienna in favour of grouping statues together on the border of the City Park. The new Architectural Society has taken the matter in hand, and is having plans prepared in a competition among its members. ——The first sod of the new Scheeberg Railway has been cut, and the works have been definitely commenced.

MISCELLANEOUS.

WINDOW, EMANUEL SCHOOL CHAPEL, WANDSWORTH.—Mr. F. Hamilton Jackson asks us to state that in this window, illustrated in our issue of December 28, the side-lights were through an error misplaced; that on the right hand side should have been on the left, and *vice versâ*. We may be allowed to add that if the artist had sent definite instructions in sending in the cartoons to us, they would of course have been followed.

A NEW CUPBOARD-FASTENER.—Mr. Joseph Sykes, of Leeds, sends us a specimen of the "Leeds Cupboard-Fastener." To the knob of the cupboard-door is attached a horizontal brass catch going through the door, with a spur at the end, catching on the turned-up end of a staple screwed to the shelf, or to the framing at the side of the door. The horizontal catch is on a spring, and fixes itself automatically on closing the door. To open the door there is a push-button in the middle of the knob, like the button on an electric bell-push, which on being pushed moves the horizontal catch sufficiently to allow of the door being opened, the spring bringing the catch back to its normal position when the pressure on the button is removed. It is simple and easily applied, and likely to be very useful, especially from the fact that it fastens automatically on merely putting the door to.

LIVERPOOL SCHOOL OF ARCHITECTURE AND APPLIED ARTS.—The number of students in the first term of the second session, 1895-96, of the Liverpool School of Architecture, has doubled that of last term, the principal increase being in the decorative painting, architectural, and wood-carving classes. There are now 139 individual students in the school, making a total of 181 class entries. These are divided as follows:—Architectural 37, sculpture and modelling 46, decorative painting 70, wood-carving 21, wrought-iron work 7. The students include architects, carvers in wood and stone, plasterers, furniture designers, joiners and carpenters, stained-glass draughtsmen, lithographers, smiths, &c. The sketch-club started at the commencement of the term has assisted greatly in bringing together the students in the different departments, and also the students of the day and evening classes.

LONDON WATER COMPANIES' CHARGES.—It is reported in the daily papers that the Vestry of St. George, Hanover-square, are making an effort with a view of obtaining legislation to prevent the London Water Companies from increasing their charges for water (which are based on annual value) by adopting the increased values in the new valuation list. The co-operation of other vestries in this movement is invited. It is considered unjust and anomalous that, without any increase whatever in the quantity of water supplied, the water companies should be entitled to raise their charges with every advance made in the assessment of house property.

PUBLIC IMPROVEMENTS, WESTON-SUPER-MARE. —Plans have been prepared for marine lakes and other extensive improvements at Weston-super-Mare. The engineers are Messrs. Wolfe Barry & Brereton, of Westminster. The area of water to be enclosed by the lakes south of Knightstone is about 1,800 yards by 800 yards, divided by an intermediate embankment from the point opposite Clevedon-road. The Knightstone pier, which will be 1,100 yards in length, will have three landing-stages, and will terminate at a point where there are from 10 to 12 ft. of water at low water of spring tides. The estimated cost of the entire scheme—lakes, pavilion, and pier—is 128,000*l.*, viz., marine lakes from Knightstone to Ellenborough Park, 38,500*l.*; additional cost of extension to sanatorium, 24,000*l.*; Glentworth Bay portion, with embankments and bridge, 25,500*l.*; low water pier, 35,000*l.*; pavilion, 5,000*l.*

REREDOS, ST. MATTHEW'S CHURCH, LANDSCOVE.—The Church of St. Matthew, at Landscove, in the Parish of Staverton, was built in the year 1851, and was the first church built from the designs of Mr. J. L. Pearson, R.A. It was intended at the time that a carved oak reredos, to Mr. Pearson's design, should be put up, but the work was not accomplished until last week. The reredos is of seasoned English oak. There is a re-table, and above it a super-altar, and the reredos itself consists of three compartments, the central one gabled. The work has been carried out by Messrs. Harry Hems & Sons, of Exeter, and under the immediate direction of the Rev. J. B. Hughes, M.A., Vicar of Staverton.

LABOUR IN THE COLONIES.—From the circular just issued by the Emigrants' Information Office, Westminster, we learn that in New South Wales prospects have so improved at the Government railway workshops at Eveleigh, that all those who had been working on reduced time, namely, blacksmiths, moulders, fitters, machinemen, and erectors, have been put on full time. There is considerable distress at the Newcastle collieries owing to the slackness of trade and consequent reductions in wages, but at those in the South prospects have improved. At Sydney there are still many hundreds of persons for whom the Government is finding or making work in country districts, on the railways, at the goldfields, and in forest thinning. In Victoria there is no demand for more labour. In South Australia there is a plentiful supply of all kinds of labour, and under the new Railway Regulations the wages of porters, enginemen, firemen, and cleaners are reduced. In Queensland trade has improved, the wool and sugar crops have been unusually large, and new railways and many miles of rabbit fencing are being constructed, so that the demand for mechanics and general labourers seems to be increasing. In Western Australia there is a good demand for miners at the Coolgardie Goldfields, but the cost of living is high, water is very scarce in summer, and the heat very great, so that no one is advised to go there unless he is strong, and has some money. There is also a good demand for mechanics at these fields, but the demand in other parts of the colony is small. The Western Australian Government propose to spend 423,000*l.* during the current financial year on works and buildings, as compared with 70,000*l.* in 1894-5, so that there ought to be increased work for men in the building trades. In Tasmania there is no general demand for more labour; many of the unemployed at Hobart have been sent to road work and other employment in country districts. It is expected that 400 or 500 men will shortly be employed on the construction of the Mount Lyell Railway, which will absorb some of the surplus labour. In New Zealand some mechanics in the cities have been out of employment; even in most prosperous times there is always a certain class which is unemployed in the large towns. In Auckland and district the building and engineering trades have been well employed, miners have been busy, and unskilled labourers have had more work than usual; at Christchurch men in the building trades have been well employed; at Dunedin there has been a good demand for stonemasons; at Wellington the number of unemployed persons is considerable. In Natal the building trades at Durban and Pietermaritzburg continue to be brisk, several large buildings being in course of construction, and there has been a strong demand for bricklayers, carpenters, and others. There has also been a fair demand for blacksmiths and farriers, cabinet-makers, and bakers; but there has been no demand for workers in stone, moulders, bootmakers, printers, miners, mill-hands, or railway-men. As a rule, persons who must depend on earning wages should not go out, unless they are nominated by friends in the colony.

THE INSTITUTION OF CIVIL ENGINEERS.—The list of members of the Institution of Civil Engineers corrected to this date (January 2), being the seventy-eighth anniversary of its establishment, shows that there are now on the books 6,794 members of all classes, representing an increase in the past twelve months at the rate of nearly 2¼ per cent.

PROPOSED ART EXHIBITION IN ABERDEEN.— The Committee of Management of Aberdeen Art Gallery have, upon a report by Mr. A. Marshall Mackenzie, A.R.S.A., architect, proceded to renew the heating apparatus in the Gallery. So soon as this has been done, the present loan exhibits will be exchanged for a new collection, to be obtained from South Kensington, with such additional exhibits from local collectors as may be obtained, the upper west room being set aside for an exhibition of engravings and etchings. The Committee have decided that the lower east front room should be reserved for the purpose of an archæological museum; and donations of objects for this department are invited.

RELICS OF PRE-HISTORIC BRITAIN.—In Monkswood Valley, about five miles distant from Bath, a reservoir for waterworks purposes is nearing completion, and the excavations have yielded a series of antiquarian relics. The first discovery of importance, says a correspondent in the *Daily Graphic*, was a series of bronze ornaments, weapons, and

implements. They were found lying in a cluster underneath a deposit of carbonate of lime. Mr. Charles Gilby, the City Engineer of Bath, who is superintending the works under Mr. W. Fox, of Westminster, having given instructions that any discoveries of the kind should be preserved with care, secured the greatest portion of the articles, though it is known that some were offered to a Bath jeweller by one of the navvies, the brightness of the metal when broken evidently having led to the belief that there was gold in their composition. Professor Boyd Dawkins and Sir John Evans, who have examined the discoveries, state their opinion that they are pre-Roman, and belong to the late Bronze Age. The series included the following:—Two twisted necklets or torques, one perfect, with a hook at either end, measuring in circumference 1 ft. 7½ in., and another, fractured, of similar measurement; also one of fine twisted wire, about half the size, probably a child's. Four perfect bracelets, varying from 8¾ in. to 9½ in. in circumference. Two broken armlets or bracelets. A circle, triangular in section, with a piece broken out, attached to a shaft bent at the base, probably a hairpin. Three sickles, unsocketed, and ribbed at the back. Two ferrules for spear-shafts, with incised lines round the edge of the socket. Base of spear-points, with two loops for attachment. Three knife or spear blades, flat on one side, three-faced on the other. A square borer, rounded and pointed at one end, tapering at the other for hafting. The discoveries of bones and horns of various animals are exceedingly interesting.

PAISLEY ART INSTITUTE EXHIBITION.—On the 23rd ult., Mr. Hippolyte J. Blanc, Edinburgh, opened the Paisley Annual Art Institute Exhibition. Mr. Blanc, in the course of an interesting address, spoke on the objects aimed at by these exhibitions. The edification of the public was not the chief gain from such exhibitions, for there were many beginners whose maiden efforts should be encouraged. If truly animated with a soul for art, by having their works in collateral relationship to those of men of acknowledged worth and ability, they learned their own shortcomings, and grew out of these in time, and became abler exponents of nature's moods or of the subtleties of the human form in portraiture. It was good to bring the influences of art within the reach of all, because no one could tell where the spark of genius lay which by such opportunities as these might be fanned into permanent lustre. The further dissemination of art must rest with an appreciative public. Fine art might be difficult to define, but he inclined to accept Ruskin's view that every art might be properly called fine that demanded the exercise of the full qualities of heart and intellect. He referred to the styles of advertisement placards, those ghosts of our promenades, and said that in years to come, with improved taste, the public would look back on these with wonder and surprise that such should ever have been permitted. That much good had already resulted from the spreading of art exhibitions was evidenced by the increased appreciation and intelligent demand for artistic articles such as were seen in Christmas cards and illustrated annuals and other periodicals. He concluded by advising young artists as to their studies, remarking that the artist must first have the soul to paint. He must paint for love, and, through his love, study and give finished expression to his efforts.

STATUE OF FLORA MACDONALD.—The last of the models for the Flora Macdonald statue in the competition which is open to Scottish artists was recently placed in Inverness Town Hall, says the *Scotsman*, where fifteen models are now arranged, forming an attractive little exhibition. With one exception, the models are simply full-length representations of the Highland heroine, and there is a good deal of sameness in the matter of pose and expression, the face and costume being evidently copied in great measure from Allan Ramsay's portrait. In several instances Flora is seen waving an adieu to Prince Charlie, and in others she is keeping watch for his enemies. But originality and variety are found in the treatment of the panels in the pedestal. The one model excepted shows the Prince reclining in sleep against the knee of Flora, who is seated on a rock and watches, pistol in hand, for the possible incursion of the Prince's pursuers. This is undoubtedly the most dramatic of the models, but there is much force and expression in many of the others, and it is evident from a glance round the interesting collection that the leading Scottish sculptors have entered the competition. It should be stated that a sum of 1,000*l.* was bequeathed by the late Captain Macdonald Macdonald, who claimed to be descended from Flora, for the purpose of defraying the cost of a statue in bronze, to be erected in Inverness. The Town Council was entrusted with the selection of a suitable site, and that body, along with the trustees of the testator, will arrange for adjudication in the competition, in accordance with the terms laid down in Captain Macdonald Macdonald's will. The committee and trustees will probably call in expert assistance when the selection comes to be made.

EXHIBITION OF MINERALS, WEARDALE, DURHAM.—An Exhibition of the mineral products of Weardale has just been opened at St. John's Chapel, and is to remain open up to the 11th inst. It contains specimens of fluorspar of all shades of colour, and specimens of lead ore. The iron ore is represented by a collection of specimens of the three leading varieties: brown haematite, steel grey ore (magnetite), and spathose ore. There are also collections of minerals of more general interest, models of the local methods of mine timbering, and various other industrial and artistic exhibits.

ENGINEERING TRADES' REPORT. — Messrs. Matheson & Grant's half-yearly report says that almost all branches of the engineering trades are actively engaged, and subject to the maintenance of peace, the year opens with better prospects than at any time since 1890. The unexpected dispute that has been sprung upon this country by the United States, may retard the general revival, towards which most trades were advancing, but the causes of improvement are too numerous and wide-spread to allow of any long postponement. For while on almost all previous occasions of revival, the recovery has been due to or has coincided with improved demands from America, on this occasion the stimulus comes entirely from our Home, Eastern, Colonial and Foreign markets outside American influence. Pig-iron, and all forms of finished iron, have risen in price. In steel, the improvement, which had commenced in July, continued, and by October rails had advanced more than 1*l.* per ton in price on the low rate of 3*l.* 10s., to which they had fallen in the spring. The strike in the shipbuilding trade has checked the growing demand for plates and ship-beams, or prices would probably now have been higher. Hematite pig-iron, the price of which mainly determines that of steel, is 5s. a ton more than in July. At Sheffield, trade is brisk, but prices have not moved upwards in the same proportion as for rails. Locomotives and Rolling-stock.—There has been a marked revival in these branches of trade. Not only has there been a demand for export, especially to India, South Africa, South America, and West Australia, but the home railways have been constrained to give out considerable orders for engines and waggons. This improvement does not, however, yet equal the manufacturing resources available in this country, and the builders of engines and rolling-stock though busier, still have to complain of low prices. Structural Steel Work.—Manufacturers are busier than a year ago, and much work is in hand for India, Japan, and elsewhere. Prices have only slightly altered and most of the advance is due to the higher price of steel. The home railways are still taking a large tonnage of bridges and girders for renewals and extensions; the bridges for the 100 miles of the Manchester, Sheffield and Lincolnshire Railway, to London, are partly completed; about 10,000 tons of steel work have just been ordered for additions to the London goods station of one of the northern lines; and demands for similar purposes are likely to continue. Mechanical engineers, machine toolmakers, and ironfounders share in the general advance, and prices though not much higher are altogether firmer. Electric lighting and transmission have been greatly developed during the past year; the various systems have passed the experimental stages and trustworthy data are available both in regard to cost and efficiency. Especially is this evident in regard to transmission of power which, though it has for some years been utilised in Europe and America, has only lately taken its place as a regular adjunct to motive power in factories and mines. Transmission up to twenty miles can now be depended on, although, when the distance exceeds two miles, economy is possible only where the local authorities permit the most effective system. The transmission of water-power has been effected in many cases for use as motive-force as well as for electric lighting, but there are delusions to be avoided in regard to the supposed cheapness of water-power. The expenditure for dams, reservoirs, conduits, and turbines is often prohibitory, and when it is realised that out of the selling prices of 6d. to 8d. per unit usual in England for electric lighting obtained by steam-power, little more than a halfpenny is expended for coal even in London, the possible saving by using water-power is obviously limited to special cases. A relaxation of the Board of Trade rules is in view, by which currents of higher tension or pressure than at present will be allowed, and with less onerous restrictions as to insulation. Abroad, there is much railway work authorised in Brazil and Argentina; a railway is to be constructed into Pekin, under auspices which are encouraging for further Chinese enterprise; in Japan and Siam the existing railways are being extended, and considerable orders have been given for bridges and rolling-stock. In Africa the Uganda railway is energetically commenced, and the locomotives have just been ordered. The Cape Government is seeking by improvements and additions to the existing lines, to retain a full share of the Transvaal traffic. India, which offers the greatest field of all, is still barred to engineers and capitalists by the inaction of the Government, who withhold the facilities and encouragement necessary to progress. In the continual fluctuations between excessive supply and increased demand, manufacturers naturally set up as their standard of good trade the exceptional time, when demand was great and prices high. But the abundant capital available in this country is ever applied to increasing the means of production, and unless absorbed by the needs of war or foreign loans, this excess tends to reduce profits to a minimum, or prevents them altogether in dull years. The competition of Germany, Belgium, and now also of Japan, increases the difficulty. On the other hand, the return to a high tariff which is threatened in the United States, though it may, like any other impediment to freedom of intercourse, damage this country as a whole, and especially the textile trades, will, if it take place, and so far as the steel and engineering trades are concerned, restrain and postpone that rivalry in our foreign and colonial markets which has already commenced. The enormous and superior natural advantages available to manufacturers in America, while they have for some time past practically terminated the former imports of iron and steel from Great Britain, have hitherto found their only possible outlet in the home market; but since the United States have been freed from the burden of the high tariff on all imported goods, a competition with Great Britain has arisen especially in South Africa and South America. If the high tariff is to be restored this competition may be less regarded for the next few years.

EDINBURGH ARCHITECTURAL ASSOCIATION.—In the short report of the paper and discussion on the Mausoleum, on page 481 of our issue of December 28th, Mr. D. J. Vallance who took part in the discussion, was described as "assistant curator of the Edinburgh Museum of Science and Art," which is incorrect; he is the "curator," not the "assistant." In reference to the same subject, Mr. Thomas Arnold, the reader of the paper in question, writes to say that he had not at the time seen the restoration of the Mausoleum by Sir Murdoch Smith, which was referred to by Mr. Vallance in the discussion as being so exceedingly similar to his (Mr. Arnold's) restoration; but that having since had an opportunity of examining it, he finds that it differs from his own restoration in almost every particular.

MESSRS. STANLEY BROS.—The firm of Stanley Bros., brick, tile, pipe, terra-cotta, &c., works, Nuneaton, has been converted into a limited company. The directors are Mr. Reginald Stanley, J.P. (Chairman), Messrs. Henry Holloway (London), John Barnsley (Birmingham), Thomas Palmer Whittaker, M.P. (London), and Arthur Houghton Rogers (Nuneaton, Managing Director). The company has been formed for the purpose of acquiring the freehold and leasehold works and business carried on at the Nuneaton brick, tile, pipe, terra-cotta, and enamel glaze works, and the leasehold Nuneaton Colliery, Nuneaton; and also of acquiring the freehold works and business known as the Dale Hall brick and tile works, situate at Burslem; and also of acquiring the leasehold brickyard and business, situate at Willenhall, near Coventry.

THE NEW YEAR HONOURS.—Among the recipients of New Year honours is Sir Frederic Leighton, who receives a peerage. He is well known as the President of the Royal Academy, a position he has filled since 1878. In the same year he was knighted, and in 1886 he was created a baronet. The only other peerage given on this occasion has been bestowed upon Mr. Henry Hucks Gibbs, F.S.A., F.R.G.S., who is the senior partner in the firm of Antony Gibbs & Sons, of Bishopsgate-street Within. The distinguished geologist, Professor Joseph Preswitch, D.C.L., F.R.S., who is made a knight, was born in 1812. He has written numerous works on the results of his reseaches, and has been awarded the medals of the Geological and Royal Societies. In 1874 he was appointed Professor of Geology at Oxford.

LEGAL.

KIRBY *v.* HARROGATE SCHOOL BOARD:

AN ALLEGED RESTRICTIVE BUILDING COVENANT.

THE case of Kirby *v.* the Harrogate School Board came before Mr. Justice North in the Chancery Division, on the 20th ult., it being a motion for an interlocutory injunction till the trial of the action to restrain the defendants from building in contravention of the terms of a restrictive covenant. It appeared that the plaintiffs were the trustees of the will of a Mr. Watson, who was the owner of some houses separated from a road through a piece of ground on which the Harrogate School Board are erecting some large schools. Mr. Watson took a conveyance of land, including both the property in respect of which the plaintiffs, as owners, were suing, and the land on which the schools were intended to be erected, and entered into certain restricted covenants to the whole land. The plaintiffs sold the property which the School Board were building on to a Mr. Sampson Fox, and took from him a restrictive covenant in the terms of the covenant contained in the conveyance to Mr. Watson. Mr. Fox sold his premises to the Harrogate School Board by agreement, without putting them to exercise their compulsory power to take the land. The material parts of the covenant were not to build within 30 ft. of the northern boundary of the property (except bay windows and porches), and not to carry on any noisy or noisome offensive trade or calling on the premises. The plaintiffs contended that the carrying on a school would be within the covenant not to carry on a noisy calling, and that the building of two towers on the northern front of the school would infringe the building line covenant. The plaintiffs' counsel admitted that on the authorities,

CONTRACTS AND PUBLIC APPOINTMENTS.

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Forms of Tender, &c. Supplied by	Tenders to be delivered.
Additions to Dyce Manure Works, Aberdeen	J. Milne & Co.	J. Duncan, Architect, Turriff, Aberdeen	Jan. 7
Alterations, &c. to Schools, Ferndale, Glam.	Ystradyfodwg Sch. B.	J. Rees, Architect, Hillside Cottage, Pentre	do.
Alterations, &c. to Stirling District Asylum, Larbert, N.B.	Governors of Beckett Hospital, Barnsley	A. & W. Black, Architects, Falkirk	do.
Additions, &c. to Hospital	Cardiff Corporation	Robt. Dixon, Architect, 5, Eastgate, Barnsley	Jan. 8
Shed, Stables, and Offices, Saltmead-road	Low Laithes Colliery Co. Lim.	W. Harpur, Borough Engineer	do.
Offices, Gawthorpe, Yorks.		F. W. Ridgway, Architect, Dewsbury	do.
Additions to Steading, Wester Pettimarcus, Kinmundy, N.B.	City of Belfast	Mr. Ferguson, Kinmundy, Mintlaw, N.B	do.
*Earthenware Pipes		City Surveyor	do
Fifty Houses, Cadoxton, Cardiff		F. Gibson, Architect, Midland Bank Buildings, Pontypridd	Jan. 9
*Alterations and Repairs to Schools, Upton Park	St. George-in-the-East Guardians	Superintendent at Sch.	Jan. 10
Business Premises, Newburgh-street	Amble Co-op. Society	G. Reavell, Jun Architect, Alnwick	Jan. 11
School, Beckett-street	Barnsley School Board	Senior & Clegg, Architects, 15, Regent-street, Barnsley	Jan. 14
*10-h.p. Gas Engine	Borough of West Ham	Borough Engineer, Town Hall, Stratford	do.
*Fifty Sets of Harness	do.	do.	do.
*New Entrance Gates and Lamps	Chelsea Guardians	Lansdell & Harrison, 12, Compton-terrace, Highbury, N.	do.
Workshop and House, near Pellon Station, Halifax		Medley Hall, Architect, 29, Northgate, Halifax	Jan. 16
*100 Gully Gratings	Bethnal Green Vestry	Surveyor, Vestry Hall	do.
*Reconstruction of Cattle Market	Colchester Corp.	Borough Engineer	do.
Hotel, Glifach Goch, Wales	Abergarw Brewery Co.	P. J. Thomas, Architect, Bridgend	Jan. 18
*Stoneware Pipe Sewers and Laying-out Sewage Farm	Langport R.D.C.	J. T. Hawkins, Somerton	do.
*Dust Destructor and Electricity Supply	Vestry of St. Leonards, Shoreditch	Kincaird, Waller, & Manville, 29, Great George-street, S.W.	Jan. 20

CONTRACTS—*Continued.*

Nature of Work or Materials.	By whom Required.	Forms of Tender, &c. Supplied by	Tenders to be delivered.
*Construction of Sewerage Works	Sandgate U.D.C.	A. R. Bowles, Engineer, Sandgate	Jan. 20
*Supply of Galvanised Iron Pails	Parish of Rotherhithe	Clerk to the Vestry, Lower-road, Rotherhithe	do.
*Pulling-down and Removal of Materials of House	do.	do.	do.
*Cast-iron Pipes, &c.	Tottenham & Wood Green Joint Drainage Committee	P. E. Murphy, 712, High road, Tottenham	do.
*New Schools	Walthamstow Sch. B.	W. A. Longmore, 7, Gt. Alie-st. Whitechapel	Jan. 21
Alterations to Buildings, &c. Bodmin	Cornwall County Lunatic Asylum Visitors	W. J. Jenkins, Architect, Bodmin	Jan. 24
*Roman Catholic Chapel	St. Pancras Burial Bd.	Segrave, Browett, & Taylor, 117, Holborn	Jan. 27
*Completion of Sewers	Manchester Corp.	City Surveyor, Manchester	Feb. 1
*Mason and Pavior's Work	Stoke Newington Ves.	S. E. Burgess, Vestry Offices, Stoke Newington	do.
*Additions to College	Methodist College, Manchester	J. Gibbons Sankey	No date
Alteration to Premises, Askew-road, Gateshead		W. J. Robson, Architect, 17, Grainger-st. Newcastle-on-Tyne	do.
Two Shops, &c. Cambridge-road, Harrogate		H. E. & A. Bown, Architects, Harrogate	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in.
*Sewer Foreman	Tottenham U.D.C.	£150 per annum	Jan. 7
*Road Surveyor	Hackney Vestry	55s. per week	Jan. 13
*Working Foreman of Joiners	London County Asy.	48s. per week	No date

Those marked with an asterisk (*) are advertised in this Nuuber. Contracts, pp. iv., vi., viii., x., *&* xxvii. *Public Appointments, pp.* xxiv *&* xxv.

if the land had been acquired by the School Board under their compulsory powers they would have had no remedy by injunction, but would in lieu thereof have been entitled to have any damage they had sustained assessed under Section 68 of the Lands Clauses Consolidation Act, 1845.

Mr. Justice North, during the course of the arguments of counsel, intimated that he could not grant an injunction at this stage to prevent noise that did not exist. He considered that the two towers were not bay windows, and were within the meaning of the restriction. He held, however, that where a public body in the *bond fide* exercise of their powers purchased land for their public purpose they were in no different position in regard to the way they could lawfully use such land if they had purchased by agreement, than if they had been put to enforce their compulsory powers. In neither case would the owner of an easement or right over the land have received notice. He would not be prejudiced by the fact that the purchase was voluntary, and his remedy would be to get compensation for any damage he sustained under the Lands Clauses Consolidation Act. He had authority to show that where land had been acquired for a public purpose, partly under compulsory power and partly by the voluntary act of the vendor, the law on this point was the same as if the purchase had been carried out entirely compulsorily as in the case of Baily *v.* De Crespigny. He (his Lordship) did not see that it made any difference whether the purchase had been carried out partly or wholly by agreement, and he therefore refused the motion.

Mr. Vernon Smith, Q.C., and Mr. Curtis Price appeared in support of the motion, and Mr. Swinfen Eady, Q.C., and Mr. Mecklem opposed.

LEEDS CORPORATION *v.* G. COOKE:

BUILDING BY-LAWS IN LEEDS.

Mr. C. M. Atkinson, the Stipendiary Magistrate for Leeds, gave his decision on the 30th ult., in reference to a prosecution instituted by the City Corporation against Mr. George Cooke, butcher, Otley-road, Headingley, who was alleged to have committed certain breaches of the by-laws in regard to the erection of buildings. Defendant's plans were disapproved by the Building Clauses Committee, but he, notwithstanding this disapproval, proceeded with the erection of new premises in Wood-lane, and the Corporation sought for an order for the demolition of the same, and also for penalties for infringement of by-laws caused by the erection of buildings of which the plans had not been approved.

The Stipendiary refused to order the demolition of the buildings, but in reference to the second information he imposed a penalty of 3*l*. On June 24 last, said the Stipendiary in setting forth the grounds of his decision, written notice was given to the defendant that the Committee of the Corporation had disapproved the plans on the ground of non-compliance with Section 57 of the Leeds Improvement Act, 1893. No evidence was tendered before him (Mr. Atkinson) to establish that the plans in question were otherwise than strictly conformable to the statutes and by-laws in force in the city, nor, indeed, did it appear on the evidence adduced in that Court that the buildings which it was proposed to erect were within the purview of Section 57 of the Act of 1893 at all—a section which related to the erection of "a new continuous line of dwelling-houses, being through houses." No attempt was made to justify the refusal of the Committee to pass the plans, the Corporation electing to rest their case on the circumstance that the plans had not in point of fact been approved. On the rejection of the plans, the defendant protested that Section 57 had no application to the works contemplated, and notwithstanding his failure to obtain the approval of the Committee, gave notice to the Surveyor to the Corporation, under By-law 65, of his intention to commence the works, and thereupon proceeded with the erection of the buildings during the month of September. On October 29 last two informations were laid by the Inspector to the Corporation, and at that time the buildings had reached the first floor, their further progress being arrested pending the hearing of the informations. It might be said that the buildings should be demolished because they were erected without consent, but such a construction of the statute would appear to him to work in many cases a manifest injustice. It would be at times a most drastic, if not a harsh and unreasonable, course to compel a man to destroy a building which he, so far as appeared from the evidence, might conceivably, on obtaining a consent hitherto improperly and arbitrarily withheld, reconstruct stone by stone and brick by brick precisely as he had erected it before he was enjoined to accomplish its demolition. If that were the law, it was his duty to administer it; but he had to consider whether the words of the Legislature were susceptible of a meaning more in conformity with the provisions of the general Acts in force throughout the kingdom for the regulation of the Public Health Act, and with the first principles of natural justice. He thought such an interpretation could be found, and, having quoted sections of Acts bearing on the matter, he said he was not empowered, under the circumstances of the present case, to make the order sought, and he added that if he were wrong as to that point he should not make an order unless he were satisfied there was no discretion. As to the second information, he had great difficulty in construing the by-laws relating to the deposit of plans. He did not agree that it was unreasonable to impose some penalty on a building owner, who, failing to secure approval for his plans, proceeded to build, instead of proceeding by mandamus. He had great difficulty in determining precisely the statutory authority for the 61st by-law, but he was not prepared to hold it to be "ultra vires." He thought the defendant liable to a penalty, but not to a penalty as for a continuing offence. He did not think the by-law authorised the imposition of a fine of 40s. per day for merely not pulling down a building which was not shown to violate any lawful requirement of the sanitary authority as to the structure of such building. The matter did not arise on the imformation before him. He did not think his decision on the first imformation would cause any difficulty to the Corporation; they had power under the Public Health Act of 1875 to pull down the buildings in question if they were not in conformity with any by-law, without the intervention of any court. But if there had been no breach, and the defendant's plans had been disapproved under a misapprehension, it would seem to him (the Stipendiary) eminently unreasonable to enjoin the defendant to undertake the demolition of his property.

Mr. Aitkinson expressed his willingness to render any assistance in case an appeal was thought desirable.

MEETINGS.

SATURDAY, JANUARY 4.

Sanitary Inspectors' Association. — The President, Sir B. W. Richardson, will deliver his New Year's address.

MONDAY, JANUARY 6.

Surveyors' Institution.—Adjourned discussion on Mr. F. Punchard's paper, entitled "The Working of the Agricultural Holdings Act, 1883." 8 p.m.

Royal Academy of Arts.—Lectures on Painting by Professor W. B. Richmond, R.A. I.—Preliminary Lecture. 4 p.m.

TUESDAY, JANUARY 7.

Glasgow Architectural Association.—Mr. G. Hill on "An Architectural Aim." 8 p.m.

WEDNESDAY, JANUARY 8.

Liverpool Engineering Society.—Mr. J. R. Fothergill on "Consumption in Marine Boilers." 8 p.m.

THURSDAY, JANUARY 9.

Society of Antiquaries.—8.30 p.m.

Royal Academy of Arts.—Lectures on Painting by Professor W. B. Richmond, R.A. II.—"The Sistine Chapel, Michelangelo." 4 p.m.

FRIDAY, JANUARY 10.

Architectural Association. — Mr. H. T. Hare on "Municipal Buildings." 7.30 p.m.

RECENT PATENTS:

ABSTRACTS OF SPECIFICATIONS.

22,632.—DOOR-FASTENER: *J. Stuttgardter.*—A device for doors arranged on the inside and adapted to be operated from the outside. A bar is pivoted to the centre of one door-post and engages with a hook or staple on the other. A crank lever is connected to the bar by means of a chain, and operated by a key introduced into a hole in the door and engaging a connecting-rod by which a pull may be exerted on the crank lever and the bar raised.

23,011.—SINKS: *H. Howse.*—An attachment for sinks or street gulleys, consisting of a hollow perforated strainer containing a solid disinfectant either suspended within the strainer or supported by an insoluble disc or plate.

23,151.—WINDOWS: *W. Taylor.*—Means for supporting windows so that they may be swung inwards for cleaning. The sashes are provided with eyes, which turn on pivots, or rods, secured to a fixed batten-rod and parting-bead on one side of the window, a folding batten-rod and parting-bead being provided at the opposite side. The sashes are suspended by a weighted cord on the pivoted side, and travel on anti-friction rollers adapted to bear against the window style.

23,780.—FIREGRATES: *J. Rigby.*—This invention dispenses with the usual grate at the bottom of fireplaces, and provides a slanting arrangement with an air-space at the back. It consists of a triangular prism-shaped frame, having bars on the long side slanting towards the bottom of the front grate-bars. A swinging damper is hinged inside the frame, and can be operated by means of an handle to regulate the draught.

24,553.—SLIDE RULES: *G. Scarfield.*—A rotary slide rule for purposes of mechanical calculation, consisting of a pair or series of rotary discs, each disc having scales marked on its surface, and all being pivoted together and provired with a radial marker. To readily ascertain the

characteristic on the marker, a toothed wheel is secured and held in position by a spring pawl. Whenever the marker passes the No. 1, a stop on the periphery of the disc gears with the wheel-teeth and turns it, so as to add or deduct one to the previous characteristic.

937.—WINDOWS: *J. Rohde.*—A sash-fastener and draught-excluder, consisting of a bracket which is screwed to the inner side of the sash and provided with a set screw at one end which projects over the inner bead and is arranged to press against a plate fastened on to the frame. The sash may thus be drawn tightly against a layer of felt or rubber placed on the inner bead.

1,256.—PLASTER SLABS: *R. Hitchins.*—A machine for continuously producing slabs of plaster from materials in a plastic state, together with a cutting mechanism for dividing the slabs into any required length. The apparatus comprises a hopper in which works a screw conveyor for extruding the plastic material from a slit-like orifice into the space between the entering ends of two endless travelling bands of canvas. The faces of these bands move horizontally over a series of rollers which exert pressure on the material and prevent the bands from sagging. The cutting is effected by a straight knife-blade fixed on a roller which is continuously rotated by gearing.

1,522.—CHIMNEY-POT: *A. Conway.*—For preventing down-draught a chimney-pot is constructed, with lateral openings provided with balanced flap-valves and guard-plates, and having a cap adapted to slide vertically in guides when raised by the sweeping-brush.

1,639.—BRICKS: *J. Fryer.*—Composition for bricks or building-blocks, consisting of pulverized lime and clinker, coal-ashes, or *débris* of a nature suitable for making mortar, the mixture being ground together in a mortar-pan, with sufficient water to make it plastic. Moulds and settling-troughs are claimed in connexion with these bricks, consisting of side-walls connected by hinges and closed by a belt.

1,983.—WINDOWS: *T. Houghton.*—Hinge for sliding windows, formed by combining two semicircular pieces of metal so that the outer piece may slide and turn on the inner, and each having straight projecting portions by which they are respectively secured to the sash and frame, grooves being formed in the outer frame where the swivelling portion is likely to impinge.

2,750.—TILES: *J. Leeming and another.*—Relates to facing tiles for walls and other surfaces, and consists in making same with a rebate or lip along two or more edges of the tile so that adjacent tiles may overlap, and also forming lipped projections at the back, by which the tiles may be secured.

3,759.—SHAPING BRICKS: *E. Kerry and another.*—Brick or stone is shaped to a plane or moulded surface by grinding on a suitable wheel.

NEW APPLICATIONS FOR LETTERS PATENT.

NOVEMBER 16.—24,076, J. Duckett & Son, Limited, and J. Duckett, Ventilation of Chimney Pots.—24,081, J. McGuin, Circular Sawing Apparatus.—24,103 F. Clasen, Draught Excluder for Doors.—24,116, P. Rolef, Tile.

DECEMBER 17.—24,131, C. Buckley, Automatic Machine for the Making of Paint and like Brushes, for Driving the Handles into Same.—24,186, T. Barmes and J. Mahoney, Door Checks.—24,197, A. Putney, Portable Buildings.—24,200, W. Büsche, Espalier Walls.—24,205, R. Norman, Automatic Fastenings for Windows.—24,215, H. Plews, Disinfecting Water-closets, &c.

DECEMBER 18.—24,219, C. Cole, Metal Nails.—24,220, A. Forster and R. Norton, Water-closet Cistern Combining the action of a Double-valve Cistern with that of a Syphon-Cistern.—24,227, W. Pearson, Apparatus for Welding, Brazing, or Soldering Metals together.—24,228, G. Fielder and R. Siddall, Securing or Fastening Windows.—24,231, J. & W. Elliott, Fire-grates.—24,243, T. Curtis, Appliance for Covering Water-closet Cisterns to Prevent Freezing.—24,254, G. Mountain, Sash-fasteners.—24,256, C. Wagner, Chimneys, and in Bricks or Blocks therefor.—24,258, H. Gardner, Disinfecting Water-closets, &c. — 24,288, L. Lloyd, Chimney-tops.

DECEMBER 19.—24,379, O. Lanch, Ornamentation of Majolica Tiles, &c.—24,389, W. Herbert and J. Hayes, Wood-block flooring.

DECEMBER 20.—24,413, C. Gradisky, Ridge Tiles for Roofing, &c.—24,549, G. Brain, jun., Mould for Making Glazed Earthenware Gully-traps.—24,460, B. Wagstaff, Ventilation of Drains.

DECEMBER 21.—24,486, M. Aspinall, Junction-marked Drain-pipes.—24,502, W. Waller, Door-retainers.—24,518, Tonks, Ltd., and J. Tonks, Door and other Hinges.

PROVISIONAL SPECIFICATIONS ACCEPTED.

21,598, F. Clee, Clip for the repairing of burst water-pipes.—21,651, J. Hookham, Improved window-sill.—21,805, H. Fairbrother, Wedge for Windows, &c.—22,111, J. Barnard and W. McCleary, Window-frame with a lapping joint, when the window is closed, weather and burglar proof.—22,173, J. Green and W. Oates, Square-top gulley-traps.—22,279, L. Gutman, Adjustable Foldfast for scaffolding.—22,508, W. Rudd, Sash-fastener.—22,513, W. Willis, Door-handles.—22,565, A. Jones, Door-knockers.—22,581, A. Ansell, Apparatus for opening casements in or out with air or water tight joints when closed.—22,689, E. Stuart, Domestic fire-grates.—22,772, J. Shanks, jun., Siphonal cisterns for water-closets, &c.—22,800, A. Studd, Alarms for doors.—23,018, E. Coulon and J. Defalque, Artificial stone.—23,155, A. Hall, Colour wash or distemper paints.—23,201, T. Downie, Window-sashes.—23,203, J. Row, Opening, closing, or adjusting fanlights, ventilators, &c.—23,292, H. Walkley, Chimney and ventilating shaft tops.—23,400, J. Boyd-Wilson, Floorings and ceilings of buildings, &c.—23,651, V. & G. Jetley, Roofing-tiles, applicable for walls and for other purposes.—23,773, M. Dessau, Paving-blocks and slabs.

COMPLETE SPECIFICATIONS ACCEPTED.

Open to opposition for two months.

22,509, E. Howard, Flushing-tanks.—3,375, W. Whitley, Machines for planing, cutting, or shaping strips of wood.—3,744, S. Ingham and others, Wood-working machinery.—3,774, E. Collier, Securing door-knobs on their spindles.—21,590, L. Hofheimer, Window-fasteners.—22,064, H. Alexander, Cisterns.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

Dec. 16.—By LOCKWOOD & TWAITES (at Bradford).
Bradford, Yorks.—18 and 19, Vulcan-st., f. £155
Dec. 19.—By J. HIBBARD & SONS.
Battersea.—1, 2, 5 and 6, Wellington-rd., f., r. 85*l.* 16*s.* 670

By JOYCE & HALL.

Chelsea.—F.g.r. 200*l.*, Fulham-rd., reversion in 98½ yrs. 5,600

By STIMSON & SONS.

Bermondsey.—10, 11, and 12, Fendall-st., f. 710
1 and 2, Lamb Alley, f., r. 39*l.* 250
51 and 52, Frean-st., u.t. 21 yrs., g.r. 6*l.*, r. 49*l.* 8*s.* 220
Walworth.—3 to 13 (odd) Princes-st., f., r. 205*l.* 8*s.* 1,500
51 and 53, Boyson-rd., u.t. 55½ yrs., g.r. 10*l.*, r. 84*l.* 720
Camberwell.—47, Northway-rd., u.t. 78 yrs., g.r. 5*l.*, e.r. 26*l.* 245

By BLAKE & CARPENTER (at Croydon).

Croydon.—71 to 79 (odd) George-st., area over half an acre. f. 6,200

By COCKETT & HENDERSON (at Woodford).

Woodford.—1 to 12, Moultrie-ter., f., r. 266*l.* 2,950

By HEPPER & SONS (at Morley).

Morley, Yorks.—Four freehold shop sites 1,512
Wellington-rd., a plot of building land, f. 605

By G. DURRANT & SONS (at Bungay).

Bungay, Suffolk.—"Archer's Farm," 77 a. 3 r. 13 p., f. 510

Dec. 20.—By MESSRS. COBB (at Sittingbourne).

Borden, Kent.—Two enclosures of land, 14 a. 2 r. 15 p., f. 1,250
Three freehold cottages, r. 31*l.* 4*s.* 285
An enclosure of land, 9 a. 0 r. 33 p., f. 450

By BOURNE & SON (at Brixham).

Brixham, Devon.—Eleven enclosures of land, 24 a. 1 r. 17 p., f. 2,250

PRICES CURRENT OF MATERIALS.

TIMBER.		
Greenheart, B.G.	ton	8/0/0 0/0/0
Teak, E.I.	load	10/0/0 16/0/0
Sequola, U.S. ft. cu		1/10 2/0
Ash, Canada	load	3/5/0 4/10/0
Birch, do.		2/15/0 4/15/0
Elm, do.		4/0/0 5/5/0
Fir, Dantsic, &c.		2/0/0 3/10/0
Oak, do.		2/15/0 4/15/0
Canada		6/10/0 8/0/0
Pine, Canada red		0/0/0 0/0/0
Do. Yellow		2/15/0 5/0/0
Lath, Dantsic, fath		4/10/0 5/10/0
St. Petersburg, Riga, &c., log		2/15/0 5/0/0
Wainscot, Riga, &c., log		2/15/0 5/0/0
Odessa, crown		2/15/0 5/0/0
Deals, Finland		
and & 1st std	100	7/0/0 8/10/0
Do. 4th & 3rd		7/0/0 8/0/0
Do. Riga		7/0/0 8/0/0
St. Petersburg, 1st yellow		9/10/0 12/0/0
Do. 2nd yellow		7/10/0 9/0/0
Do. white		8/0/0 9/10/0
Swedish		7/0/0 15/10/0
White Sea		7/15/0 14/15/0
Canada, Pine 1st		21/0/0 25/0/0
Do. do. 2nd		16/0/0 17/0/0
Do. do. 3rd, &c.		8/0/0 10/0/0
Do. Spruce, 1st		9/0/0 10/10/0
Do. do. 3rd and 2nd		6/15/0 7/10/0
New Brunswick		6/0/0 7/0/0
Battens, all kinds		5/0/0 20/0/0
Flooring boards, sq., 1 in. prep.		0/9/6 0/14/6
rst		0/6/6 0/11/6
Other qualities		0/4/6 0/7/6
Cedar, Cuba	ft.	/4 /4½
Honduras, &c.		/3½ /4½
Mahogany, Cuba		/3½ /6
St. Domingo, cargo av.		/2½ 1/0
Mexican do. do.		/4 /4½
Tobasco do. do.		/4½ /6
Honduras do.		/4½ /6
Box, Turkey	ton	4/0/0 15/0/0
Rose, Rio		7/0/0 16/0/0
Bahia		6/0/0 15/0/0
Satin, St. Domingo		0/0/5 0/1/0

TIMBER *continued*.		
Satin, Porto Rico		0/0/6 0/1/6
Walnut, Italian		0/0/3 0/0/7
METALS.		
Iron—Pig, in Scotland	ton	2/5/4 0/0/0
Bar, Welsh, in London		5/12/6 5/15/0
Do. do. at works in Wales		5/2/6 5/5/0
Do. Staffordshire, in London		6/0/0 6/10/0
COPPER—British cake and ingot		44/1c/0 45 0/0
Best selected		45/0/0 45/10/0
Sheets, strong		51/12/0 0/0/0
Chili bars		41/2/6 41/7/6
YELLOW METAL		0/0/4 9-16 0/0/4½
LEAD—Pig		
Spanish	ton	11/5/0 11/6/3
English com. brands		11/7/6 11/10/0
Sheet, English, 6 lbs. per sq. ft. and upwards		12/10/0 12/12 6
Pipe		12/10/0 0/0/0
ZINC—English sheet	ton	18/5 0 18/10/0
Vieille Montagne		18/15/0 0/0/0
TIN—Straits		59/12/6 60/2/6
Australian		60/7/6 60/17/6
English Ingots		64/15/0 65 0/0
Banca		63/10/0 64/c/0
Billiton		63/0/0 63/10/0
OILS.		
Linseed	ton	19 10/0 20 0/0
Cocoanut, Cochin		25/5/0 25 10/0
Do. Ceylon		22 10/0 22/15/0
Palm, Lagos		22/10/0 0/0/0
Rapeseed, English pale		24/5/0 24/15/0
Do. brown		23/0/6 23/10/0
Cottonseed ref.		16/12 6 17/5 0
Oleine		19/10/0 20/10/0
Lubricating, U.S.		6/6/0 8/9/0
Do. black		4/9/0 6/6/0
TAR—Stockholm barrel		0/19/6 0/0/0
Archangel		0/15/0 0/0/0

TENDERS.

[Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than* 10 *a.m. on Thursdays.* N.B.—We cannot publish Tenders unless authenticated by the name and address of the sender: and we cannot publish lists in which the accepted Tender is below £100.]

ABERDEEN.—Accepted for the construction of 140 yards brick and concrete sewer, Union-grove, also sewerage works, South Forest-road, for the Town Council. Mr. Wm. Dyack, Burgh Surveyor, Town House, Aberdeen:—
Alex. McKay, 17, Elmfield-avenue, Aberdeen ..£558 14 4

AMBLE (Northumberland).—For the execution of water supply works, consisting of two reservoirs and laying eleven miles c.-i. pipes, &c., for the Urban District Council of Amble. Mr. M. Temple Wilson, water engineer, Alnwick. Quantities by Mr. Geo. Bell, 60, Collingwood-street, Newcastle-on-Tyne:—

A. Brunton & Son	£9,768	13 5	Wm. Carr £6,512 12 2
Bland Bros.	7,880	0 0	G. E. Simpson 6,340 12 4
J. G. Rutter & Sons	7,815	1 3	John Carrick 6,313 11 0
R. Hudson, jun.	7,437	3 0	R. Cane & Son, Amble, Ackling-ton (accepted) 5,897 19 6
Jos. M'Guire	7,396	1 0	
David Shanks	6,520	18 3	

[Engineer's estimate for all expenses, £6,600.]

BARNSTAPLE.—For the execution of wood-paving works, High-street (9,0 yds), for the Town Council of Barnstaple. Mr. Thomas Lee, Surveyor. Quantities by Surveyor:—

	Per yd. s. d.		Per yd. s. d.
T. Barwick	10 5	C. L. Duke	7 9
J. N. Hancock	8 6	Acme Wood Flooring Co., Ltd., London (accepted)	6 9
G. H. Wilkins	8 5		

BECKENHAM (Kent).—For making-up, &c., Princes-road, for the Urban District Council:—

Fry Bros.	£471	17 4	Mowlem & Co, Grosvenor Wharf, Westminster* £385 5 6
T. Adams	452	19 2	
E. Iles	417	9 0	

[Surveyor's estimate, £432.]
* Accepted.

BEXHILL-ON-SEA.—For the erection of a house in Lower Sea-road, for Mr. W. Meads. Mr. Wm. Cooper, architect, 21, Havelock-road, Hastings. Quantities by the architect:—

H. T. Squirrell	£2,172	W. D. Midmer	£1,657
C. H. Gold	1,900	G. Vigor & Co.	1,598
Barker & Rogers	1,850	Midmer Bros.	1,583
J. C. Kenwood	1,830	D. H. Snow	1,516
Padgham & Hutchinson	1,799	A. H. White	1,550
Eldridge & Cruttenden	1,789	H. E. Cruttenden	1,545
W. Coussens	1,740	C. W. Peiling-Hurrell, St. Leonard's (accepted)	1,450
J. Simmonds & Co.	1,989		

BECKENHAM (Kent).—For making-up, &c., Linden Grove, for the Urban District Council:—

Fry, Bros.	£740	13 8	Mowlem & Co, Grosvenor Wharf, Westminster* £620 0 0
T. Adams	714	10 10	
E. Iles	658	6 4	

[Surveyors' estimate, £622.]
* Accepted.

CHESTER-LE-STREET (Co. Durham).—For erecting a branch bank, for Messrs. Lambton & Co., of Newcastle-on-Tyne. Mr. John W. Dyson, architect, Newcastle. Quantities by Mr. J. P. Allen, Newcastle:—

Thompson & Son	£4,256	6 5	C. Groves, Chester-le-Street* £3,186 18 6
W. C. Tyrie	3,562	17 6	
John Keil	3,204	16 0	

* Accepted.

CLACTON-ON-SEA.—For the construction of sea defences, sewers, storm overflows, &c., for C. G. Round's Trustees. Mr. T. H. Baker, architect, Colchester and Clacton-on-Sea. Quantities by the architect:—

G. Bell	£5,308	0 0	Mackenzie £4,180 0 0
Wimpey & Co.	5,280	0 0	Adams 4,162 6 9
Botterill	4,697	0 0	Pedrette & Co. 3,825 5 6
Hipwell	4,481	0 0	Lingell 3,798 0 0
Mills	4,467	0 0	B. Cooke & Co.,
G. Rackham	4,209	0 0	Battersea* 3,701 0 0

[Architect's estimate, £4,645.]
* Accepted.

DOVER.—Accepted for the erection of a new bakehouse, Church-street, Dover, for Messrs. Igglesden & Graves. Messrs. Worsfold & Hayward, architects, Dover and London:—
H. Stiff, Dover £768 18

GUILDFORD.—For the erection of a Church Institute, for the Parish of Stoke. Mr. John Lake, architect, Bridge-street, Guildford. Quantities by Mr. H. J. Leaning, 28, John-street, Bedford-row:—

R. Smith	£2,758	Gale & Sons	£2,528
Swayne & Sons	2,715	Higlett & Hammond, Guildford (accepted)	2,447
Stanley Ellis	2,569		
Mitchell Bros.	2,565	W. C. Lillington	1,980

GUILDFORD.—For the erection of new latrines at the Stoke Parochial Schools. Mr. John Lake, architect, Bridge-street, Guildford:—

Stanley Ellis	£462	C. How, Guildford*	£279
Higlett & Hammond	298		

* Accepted.

GUILDFORD.—For the drainage of Eastbury Manor, for Mrs. Ellice. Mr. John Lake, surveyor:—

Higlett & Hammond	£693	0	Heal & Jackson, Compton (accepted) £470 16
Stanley Ellis	649	0	
Freme & Mason	614	0	

GUILDFORD.—For additions and alterations to Stoke Hill, for the Rev. Francis Paynter, M.A. Mr. John Lake, architect, Bridge-street, Guildford. Quantities by Mr. H. J. Leaning, 28, John street, Bedford-row:—

Gale & Sons	£4,075	Mitchell Bros.	£3,797
Colls & Sons	4,020	Higlett & Hammond, Guildford (accepted)	3,656
Stanley Ellis	3,915		
W. Smith & Sons	3,840	F. Milton	3,455

LEIGHTON BUZZARD.—For the erection of new shop, showrooms, &c. (excluding shop-front), at Leighton Buzzard, for Mr. R. T. Mallett. Quantities supplied. Mr. W. F. Taylor, architect, Aylesbury:—

Webster & Cannon	£1,238	0	Garside & Son £1,059 10
Tutt	1,238	0	Ayres 1,039 0
Yirrell	1,095	0	Cook & Sons, Leighton Buzzard* 1,030 0
Dawson	1,075	0	

* Accepted.

LONDON.—Accepted at schedule of prices for plumbers' work at Foundry, Holborn Viaduct, E.C.:—
George Barker, Mile End.

LONDON.—Accepted for reinstatements after fire at 30, 32, 34, Brick-lane, E., for Mr. James T. Ayton, 2, The Mount, E.:—
George Barker, Mile-end £620

LONDON.—For interior cleaning, Highway School, Shadwell, for the School Board for London:—

Atherton & Dormer	£273	Corfield	£195
Hack	227	Holliday	190
Symes	212	George Barker, Mile End*	180

* Accepted.

LONDON.—For interior cleaning, Olga-street Schools, for the School Board for London:—

Gibbs	£350	0 0	G. Barker £299 13 0
Britton	328	0 0	Silk 297 0 0
Wilmott	318	10 0	Corfield* 263 0 0
White & Son	305	3 6	

* Accepted.

LONDON.—For alterations and additions at Bell House, Dulwich, for Mr. H. Tidy. Messrs. W. Bradbear & Co., architects, Canonbury Station, N.:—

Stead	£820	Simpson & Cove	£667
Mitchell	749		

LONDON.—Accepted for the erection of warehouse and stabling in Asylum-road, Old Kent-road, S.E., for Messrs. Drysdale Bros. Messrs. Waring & Nicholson, architects, 55, Parliament-street:—
F. & H. F. Higgs £5,955

LONDON.—For alterations and fittings required to be done at the "Ship and Billet" tavern, East Greenwich, for Mr. R. Stringer. Mr. James Warne, architect, 1, Montpelier-road, Peckham:—

W. Smith	£2,469	Simpson & Cove	£2,200
L. Whitehead & Co.	2,450	J. Tyerman*	2,200
H. L. Holloway	2,300		

Pewterers' Work, &c.

Warne & Co.* £151

* Accepted.

LONDON.—Accepted for further alterations and additions required to be done for Messrs. Dottridge Bros., East-road, City-road, N.:—
John Weibking & Sons £225

LONDON.—For alterations and additions to the premises, Nos. 39 and 41, Seven Sisters-road, Holloway, for Mr. C. Garrod. Mr. Frederic Hammond, architect, 54 and 55, London-wall:—

Ashby Brothers	£1,153	Larke & Son	£884
Dove Brothers	985	Macfarlane Brothers	835
W. T. Ballard	905	W. H. Stevens	795

LONDONDERRY (Ireland).—For the erection of a dwelling-house, Marlborough-street. Mr. R. Eccles Buchanan, architect, 33, Shipquay-street, Londonderry:—

Robt. Colhoun	420	Jas. A. Fulton	£370
Wm. J. Maultsaid	£375	Matthew McClelland, Strand*	345

* Accepted.

MANSFIELD.—For the Mansfield Corporation Waterworks, Contract No. 3. Messrs. George & F. W. Hodson, engineers, Loughborough:—

Wilkinson Bros.	£6,349	J. H. Vickers, Ltd.	£5,345
H. Roberts	5,730	J. Tomlinson	5,325
J. F. Price	5,513	Amos Jenkins, Southwell*	5,012
John Lane & Sons	5,424		

* Accepted.

MORPETH.—For forming, metalling, channelling, &c., new roads in the district. Mr. George Reavell, jun., architect, Alnwick :—
Joseph Wardlaw, Newcastle-on-Tyne.....£673 11 2

PRESTON (Lancs.).—For the construction of a reservoir, &c.' for the Fulwood Urban District Council. Mr. John J. Myres, C.E.' 15, Chapel-street, Preston :—

W. H. Drake & Co.	£24,665 8 6!	Saml. Matthews	£11,889 0 0
Wm Clarkson	17,515 19 1	A. Braithwaite & Co.	11,507 0 0
Daniel Diggle	15,468 0 0	Enoch Tempest	11,249 5 0
Brown, Philips, & Co.	13,407 14 6	Louis P. Nott	11,200 0 0
J. & M. Hawley	13,368 16 0	S.W. Pilling & Co.	10,534 0 0
W. Winnard	13,195 10 0	John Sharples	10,337 19 0
Holme & King	13,142 1 0	H. J. Bentley	9,541 0 0
Jas. Watson	12,117 16 7	Simon Johnson, Islam o'th Height (accepted)	9,318 0 0!
C. Braddock	12,078 17 1		

REDHILL.—For the re-erection of the Reigate and Redhill Hygienic Steam Laundry at St. John's, Redhill, destroyed by fire. Mr. John Lake, architect, Bridge-street, Guildford. Quantities by Mr. H. J. Leaning, 28, John-street, Bedford-row :—

F. Milton	£1,578	Gale & Sons	£1,355
Bagaley & Sons	1,460	J. Bushby	1,349
Higlett & Hammond	1,415	W. F. Wilkinson	1,275
J. W. Humphrey	1,395	J. J. Carrick, Redhill*	1,264
J. Buckland	1,369		

* Accepted.

ST. LEONARDS-ON-SEA.—For alterations to No. 36, London-road, for the International Tea Company. Mr. William Cooper, architect, 21, Havelock-road, Hastings :—

A. H. White	£498	Padgham & Hutchinson	£476
J. Lester	490	C. Hughes, St. Leonards*	437

* Accepted.

WHITLAND (Carmarthenshire).—Accepted for the erection of Intermediate school buildings. Messrs. Griffiths & Jones, architects, Pontypridd and Tonypandy. Quantities by architects :—
Rowlands & Lloyd, Trealau, near Pontypridd £1,875
[Seven other tenders sent in.]

YARMOUTH.—For additions and alterations, Messrs. Arnold Bros.' premises, Great Yarmouth. Messrs. Bottle & Olley, architects, 5, Queen-street, Great Yarmouth. Quantities by architects :—

Whole tenders excepting Plumbing, &c.

J. F. W. Bray	£1,318 0	C. Wiseman	£1,230 0
J. Leggett	1,297 0	G. Beech	1,222 0
J. Ward	1,253 0	J. S. Cooper	1,218 2
G. Flaxman	1,246 16	F. Grimble	1,190 0

[All of Great Yarmouth.]

Bricklaying, Plastering, Masonry, and Slating.

J. Ward	£819 0	C. Wiseman	771 15
J. Leggett	785 0	G. Flaxman, Great Yarmouth *	734 10
G. Beech	777 0		

Carpentry and Joinery.

J. S. Cooper	£472	F. Grimble, Great Yarmouth *	£434
C. Cafley	458		
Carter & Wright	457		

Plumbing, Glazing, and Painting.

J. E. Dyson	£144 0	J. T. Goffin *	£122 10

* Accepted.

TO CORRESPONDENTS.

E. R. S. (below our limit).—A. H. (too late : next week).

NOTE.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

We cannot undertake to return rejected communications.

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THE ABBEYS OF GREAT BRITAIN.

In each case—VIEW, specially drawn for this series ; GROUND PLAN, to a large scale, shaded to indicate the date and style of the several parts ; DESCRIPTIVE ARTICLE, &c.

1894.		1895.	
Westminster	JAN.	8. Fountains	JAN.
Rievaulx	JULY.	9. Tynemouth	FEB.
3. Glastonbury	AUG.	10. Malmesbury	MARCH.
4. Croyland	SEPT.	11. Netley	APRIL.
5. Whitby	OCT.	12. Bolton	MAY.
6. Bath	NOV.	13. Lindisfarne	JUNE.
7. Tewkesbury	DEC.	14. Furness	JULY.
		15. Romsey	OCT.
1896.			
16. Kirkstall	JAN.	18. Jervaulx	JULY
17. Abbey Dore	APRIL.	19. Byland	OCT.

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SUTTON ST. EDMUND (Lincs.).—For the erection of school buildings and teachers' residence, for the School Board. Mr. R. H. H. Hand, architect, Spalding :—

E. Girling & Co.	£1,340 0 0	Elworthy & Sons	£1,654 0 0
W. Greenfield	1,355 0 0	J. R. Bateman	1,050 0 0
Allister & Cooper	1,119 15 0	J. H. Perkins	1,040 0 0
Wadsley & Co.	1,106 4 6	Solden Hipwell, Wisbech*	1,038 10 0
C. A. Watson	1,075 0 0		

* Accepted.

WIMBLEDON.—For building nine cottages at Wimbledon. Mr. A. J. Best, architect, 38, Sloane-street, Belgravia :—

Simmons	£3,750	Gorringe	£2,650
Burgess	3,560	Went	2,277
Chinchen	3,350	Wilcox	2,190
Bates & Son	2,925	Jackson	2,185
Grist	2,788	Richardson	2,164
May & Co.	2,700		

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Advertisements for the current week's issue are received up to THREE o'clock p.m. on THURSDAY, but "Classification" is impossible in the case of any which may reach the Office after HALF-PAST ONE p.m. on that day. Those intended for the Front Page should be in by TWELVE noon on WEDNESDAY.

SPECIAL.—ALTERATIONS IN STANDING ADVERTISEMENTS or ORDERS TO DISCONTINUE same must reach the Office before 10 a.m. on WEDNESDAY MORNING.

The Publisher cannot be responsible for DRAWINGS, TESTIMONIALS, &c. left at the Office in reply to advertisements, and strongly recommends that of the latter COPIES ONLY should be sent.

PERSONS Advertising in "The Builder," may have *Replies addressed to the Office, 46, Catherine-street, Covent Garden, W.C. free of charge.* Letters will be forwarded if addressed envelopes are sent, together with sufficient stamps to cover the postage.

AN EDITION Printed on THIN PAPER, for FOREIGN and COLONIAL CIRCULATION, is issued every week.

READING CASES, { NINEPENCE EACH. By Post (carefully packed), 1s.

W. H. Lascelles & Co.,

121, BUNHILL ROW, LONDON, E.C.

Telephone No. 270.

HIGH-CLASS JOINERY,
LASCELLES' CONCRETE

Architects' Designs are carried out with the greatest care.

CONSERVATORIES,
GREENHOUSES,
WOODEN BUILDINGS,
Bank, Office, & Shop Fittings.
CHURCH BENCHES & PULPITS.

ESTIMATES GIVEN ON APPLICATION.

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"THE BUILDER" Is supplied DIRECT from the Office to residents in any part of the United Kingdom, at the rate of 19s. per annum PREPAID. To all parts of Europe, America, Australia, New Zealand, India, China, Ceylon, &c., 26s. per annum. Remittances (payable to DOUGLAS FOURDRINIER) should be addressed to the publisher of "THE BUILDER," No. 46, Catherine-street W.C.

SUBSCRIBERS in LONDON and the SUBURBS, by prepaying at the Publishing Office, 19s. per annum (or 4s. 9d. per quarter), can ensure receiving "The Builder," by *Friday Morning's Post.*

THE BATH STONE FIRMS, Ltd.

BATH,
FOR ALL THE PROVED KINDS OF
BATH STONE.
FLUATE, for Hardening, Waterproofing, and Preserving Building Materials.

DOULTING STONE.

CHARLES TRASK & SONS,
(THE DOULTING STONE COMPANY),
DOULTING, SHEPTON-MALLET.
London Agent:
E. A. WILLIAMS, 16, Craven-st., Strand, W.C.

HAM HILL STONE.

The attention of Architects is specially invited to the durability and beautiful COLOUR of this material. Quarries well opened. Quick despatch guaranteed. Stonework delivered and fixed complete. Samples and estimates free. Address, The Ham Hill Stone Co., Norton, Stoke-under-Ham, Somerset. London Agent : Mr. E. A. Williams, 16, Craven-st., Strand, W.C. [ADVT.

Asphalte.—The Seyssel and Metallic Lava Asphalte Company (Mr. H. Glenn), Office, 42, Poultry, E.C.—The best and cheapest materials for damp courses, railway arches, warehouse floors, flat roofs, stables, cow-sheds and milk-rooms, granaries, tun-rooms, and terraces. Asphalte Contractors to the Forth Bridge Co. [ADVT.

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For 1896, price 6d. post 7d. In leather 1/- Post 1/1 [ADVT.

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MONUMENT CHAMBERS,
KING WILLIAM STREET, LONDON, E.C.

Registered Trade Mark,

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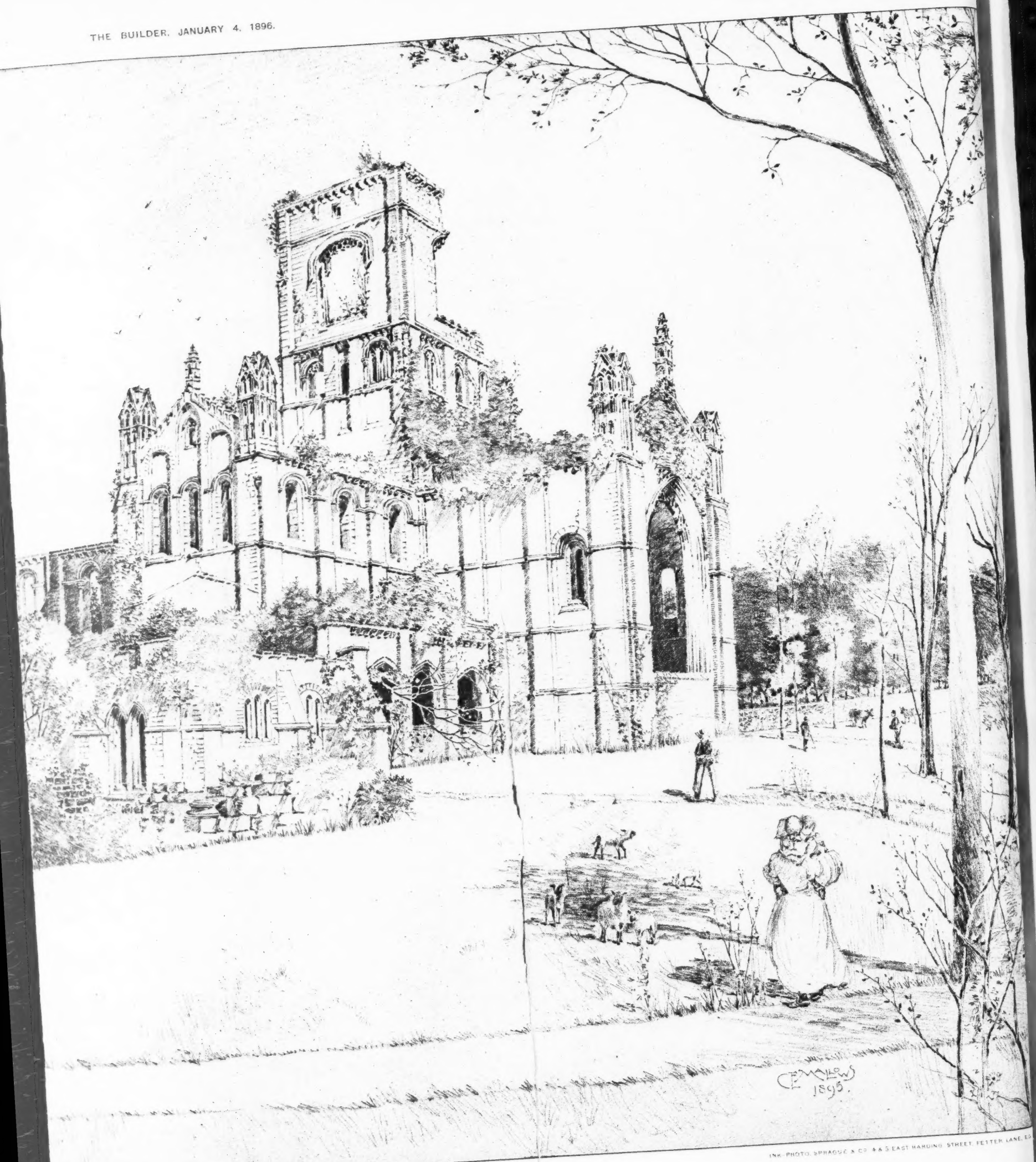
THE ABBEYS OF GREAT BRITAIN.—No. 16. KIRKSTALL.

Drawn by Mr. C. E. Mallows.



INK-PHOTO. SPRAGUE & Co. 4 & 5 EAST HARDING STREET, FETTER LANE, E.C.

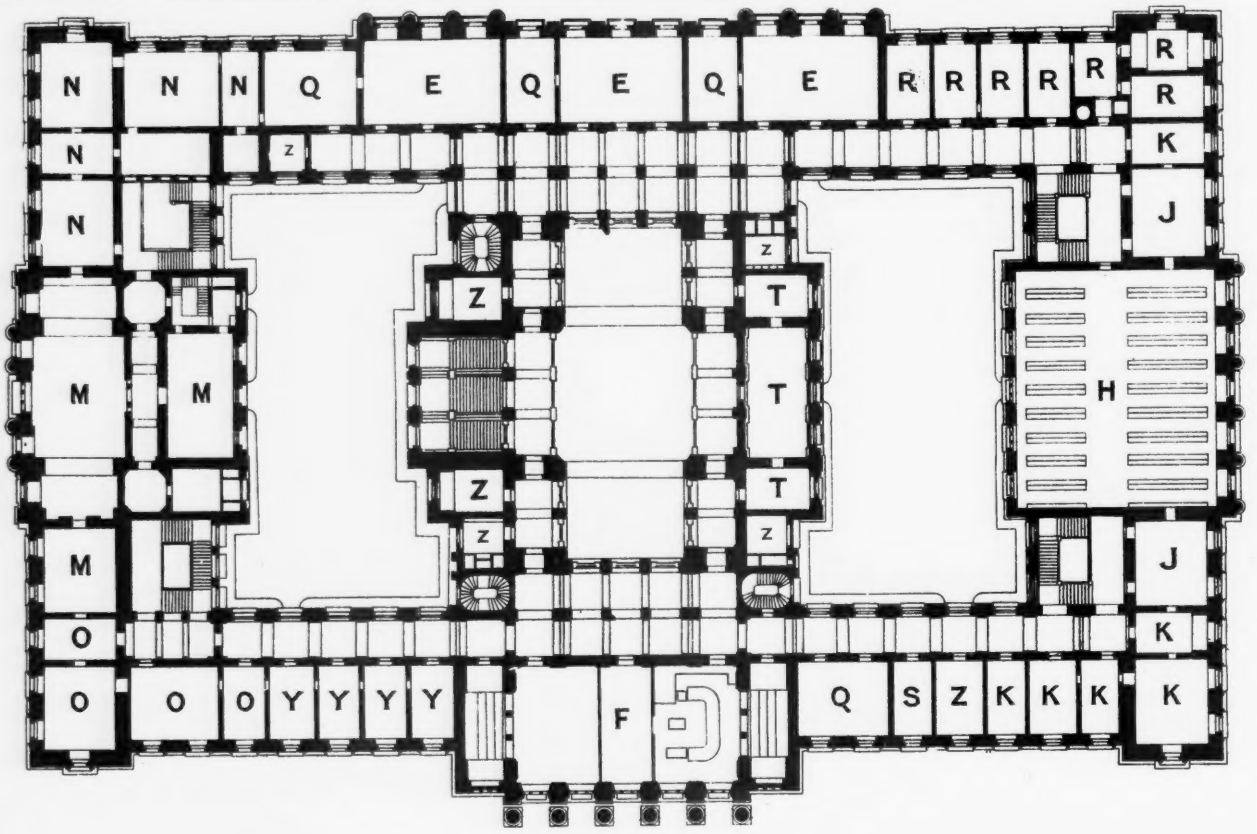
ABBEYS OF GREAT BRITAIN.—No. 16. KIRKSTALL.

DRAWN BY MR. C. E. MALLOWS.

"L'APOTHÈOSE DES LETTRES": CEILING IN THE SALON DES LETTRES, AT THE HOTEL DE VILLE, PARIS

INK-PHOTO. SPRAGUE & Co 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

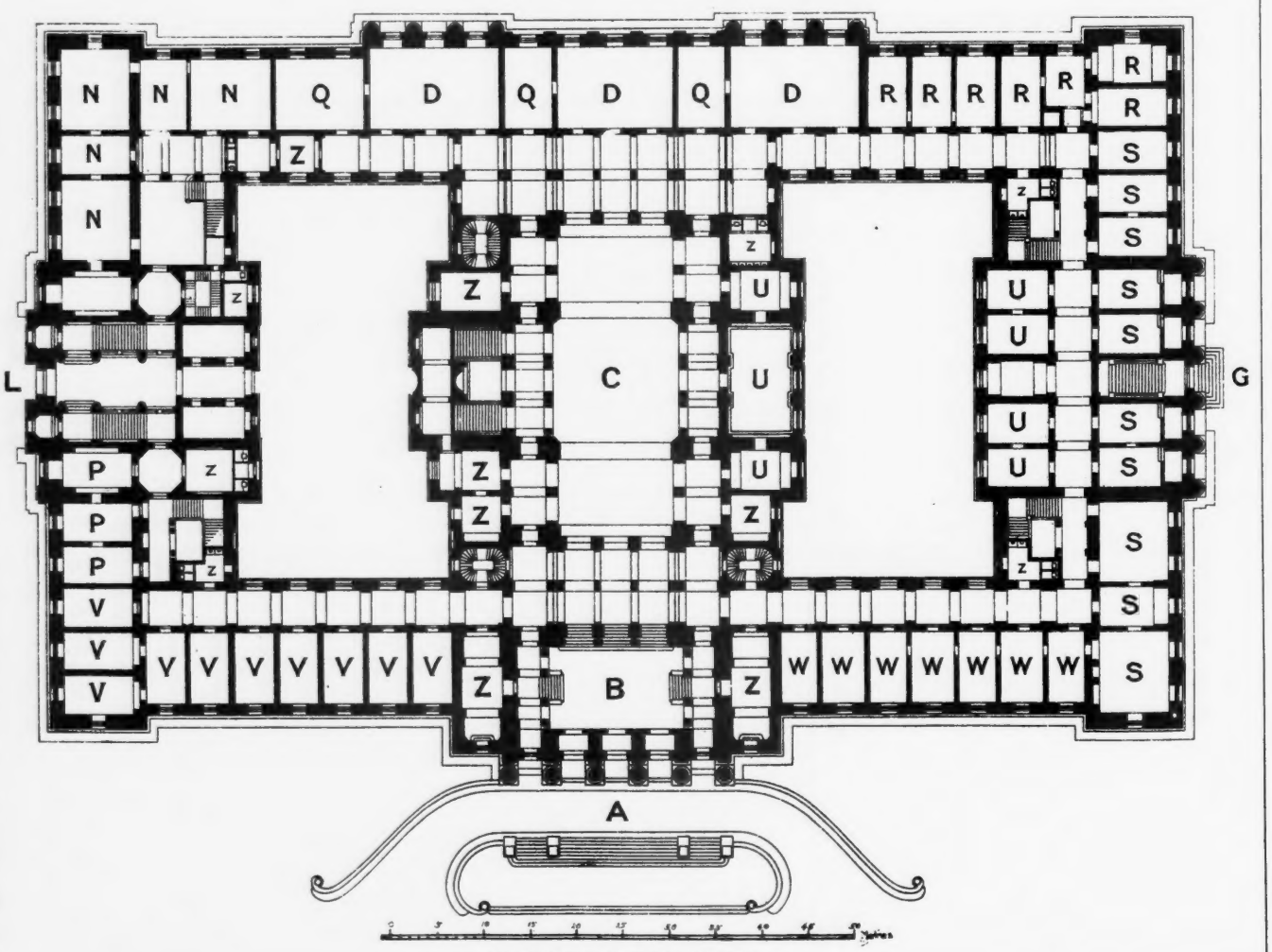
IN THE SALON DES LETTRES, AT THE HOTEL DE VILLE, PARIS.—Painted by M. Jules Lefebvre.



FIRST FLOOR PLAN.

References to Lettering on Plans.

- **A.** Main Entrance.
- **B.** Grand Vestibule.
- **C.** Salle des Pas Perdues.
- **D.** Criminal Courts.
- **E.** Civil Courts.
- **F.** The Grand Court.
- **G.** Judges' and Library Entrance.
- **H.** Library.
- **J.** Reading Room.
- **K.** Librarian.
- **L.** President's Entrance.
- **M.** President's Reception Rooms.
- **N.** President's Living Rooms.
- **O.** President's Study.
- **P.** Guests' Rooms.
- **Q.** Judges' Retiring Rooms.
- **R.** Judges' Chambers.
- **S** Public Prosecutor.
- **T.** Advocates.
- **U.** Secretarial Office.
- **V.** General Office.
- **W.** Accountant's Office.
- **Y.** Administrative Office.
- **Z.** Ushers, Waiting Rooms, &c.
- **z.** Lavatories, &c.



GROUND FLOOR PLAN.

THE IMPERIAL LAW COURTS, LEIPSIC: PERSPECTIVE VIEW AND PLANS.—Herr Ludwig Hoffmann, Architect.

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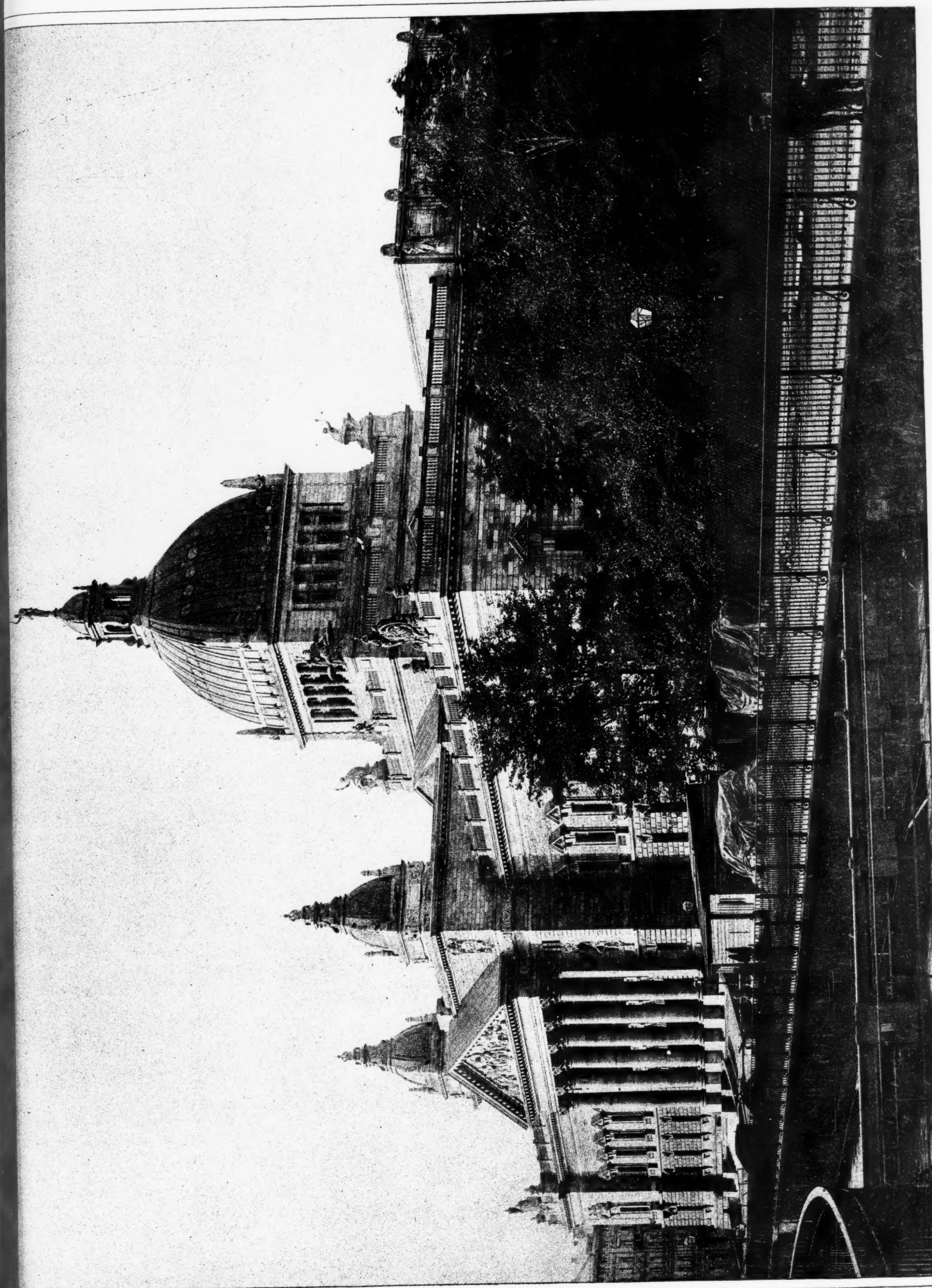
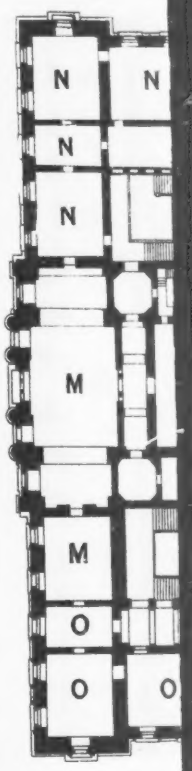
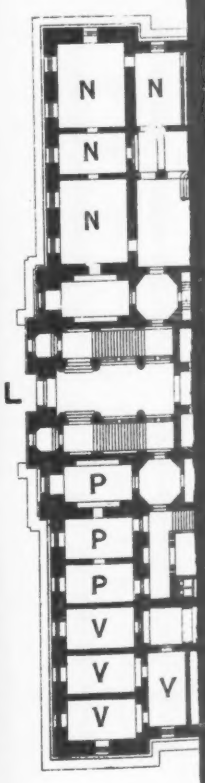




A. Main Ent
B. Grand Ve
C. Salle des
D. Criminal
E. Civil Cou
F. The Gran
G. Judges' a
H. Library.



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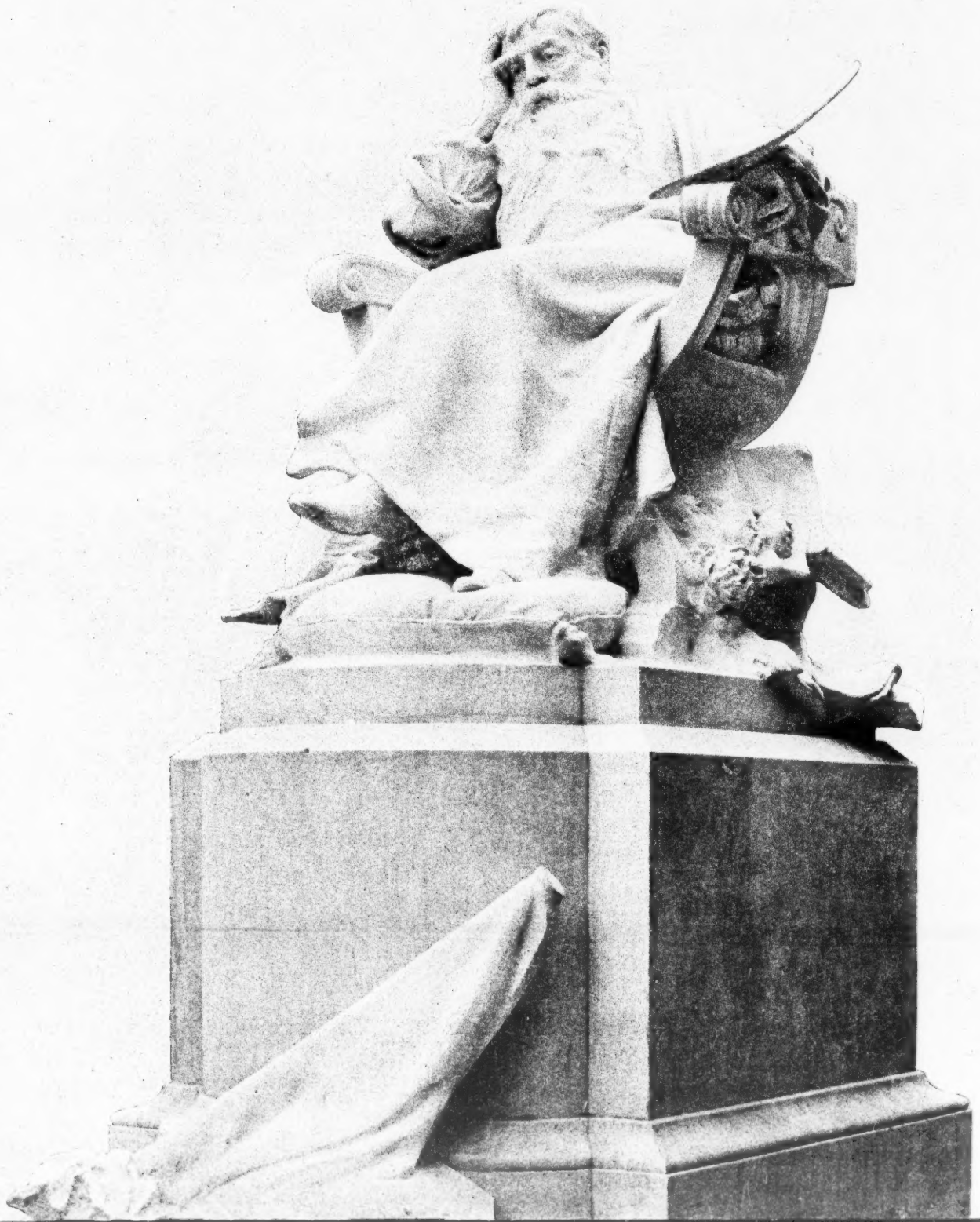
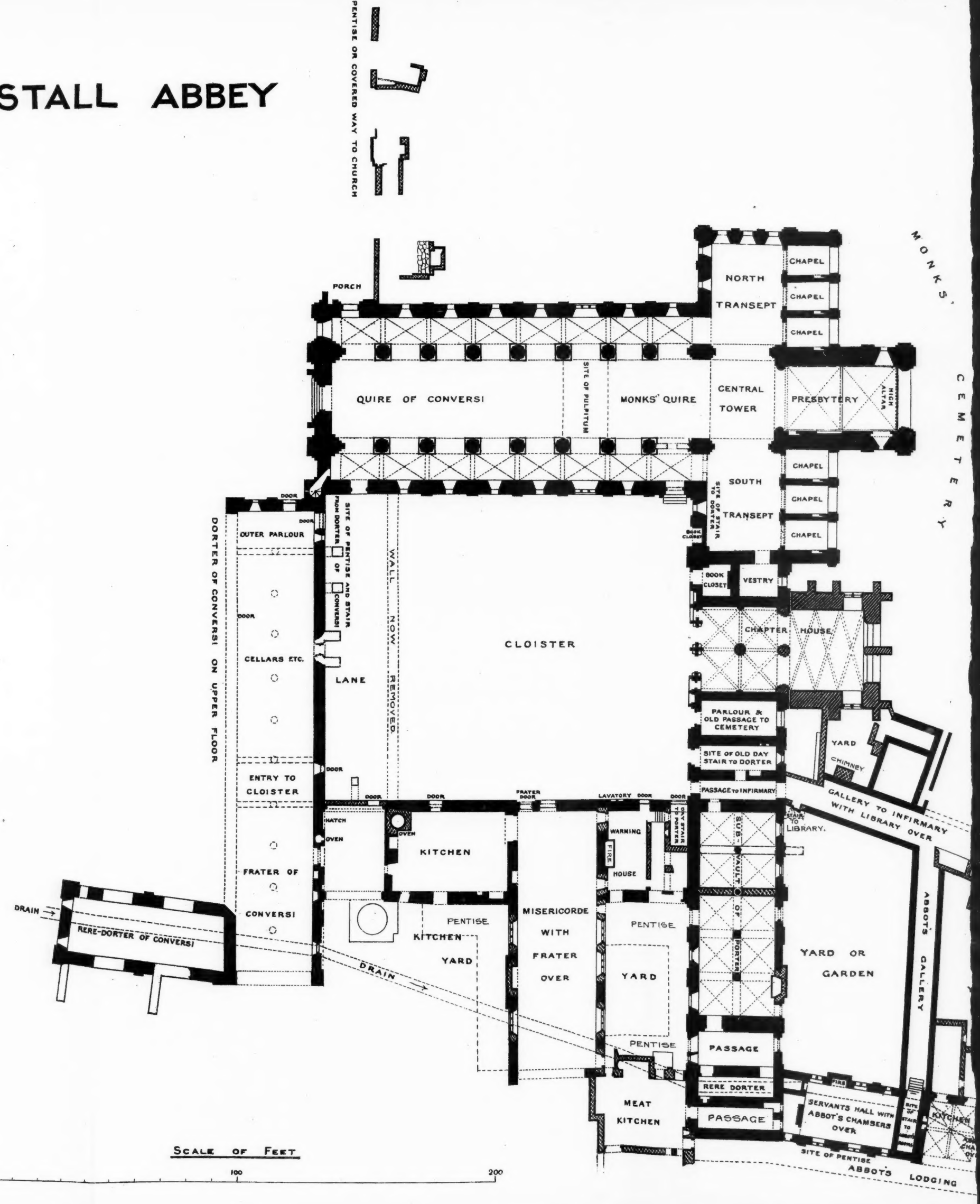
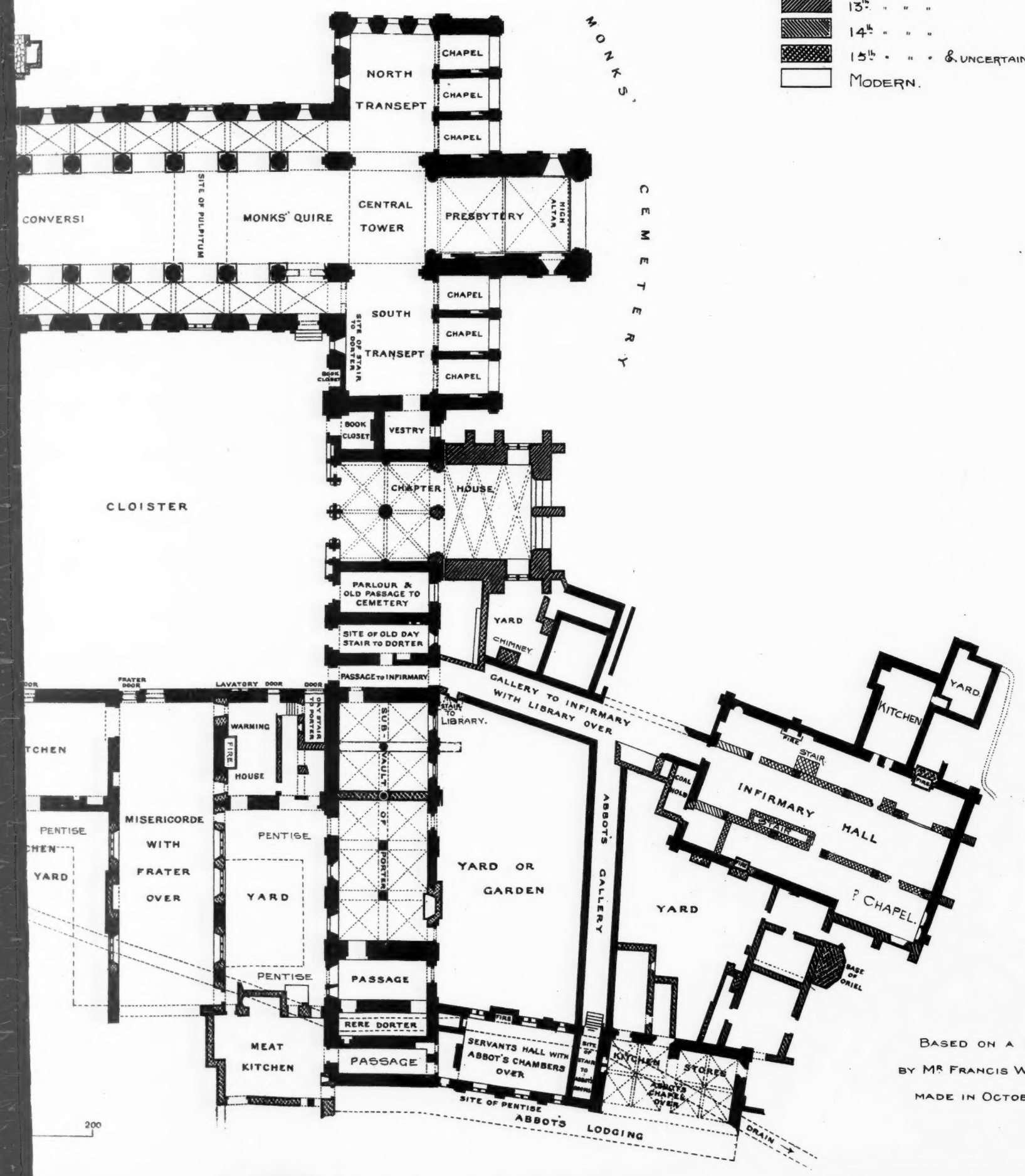
MONUMENT TO MEISSONIER, IN THE "JARDIN DE L'INFANTE" OF THE LOUVRE.—M. MERCIÉ, SCULPTOR



KIRKSTALL ABBEY





BASED ON A PLAN
BY MR FRANCIS W. BEDFORD
MADE IN OCTOBER 1893.

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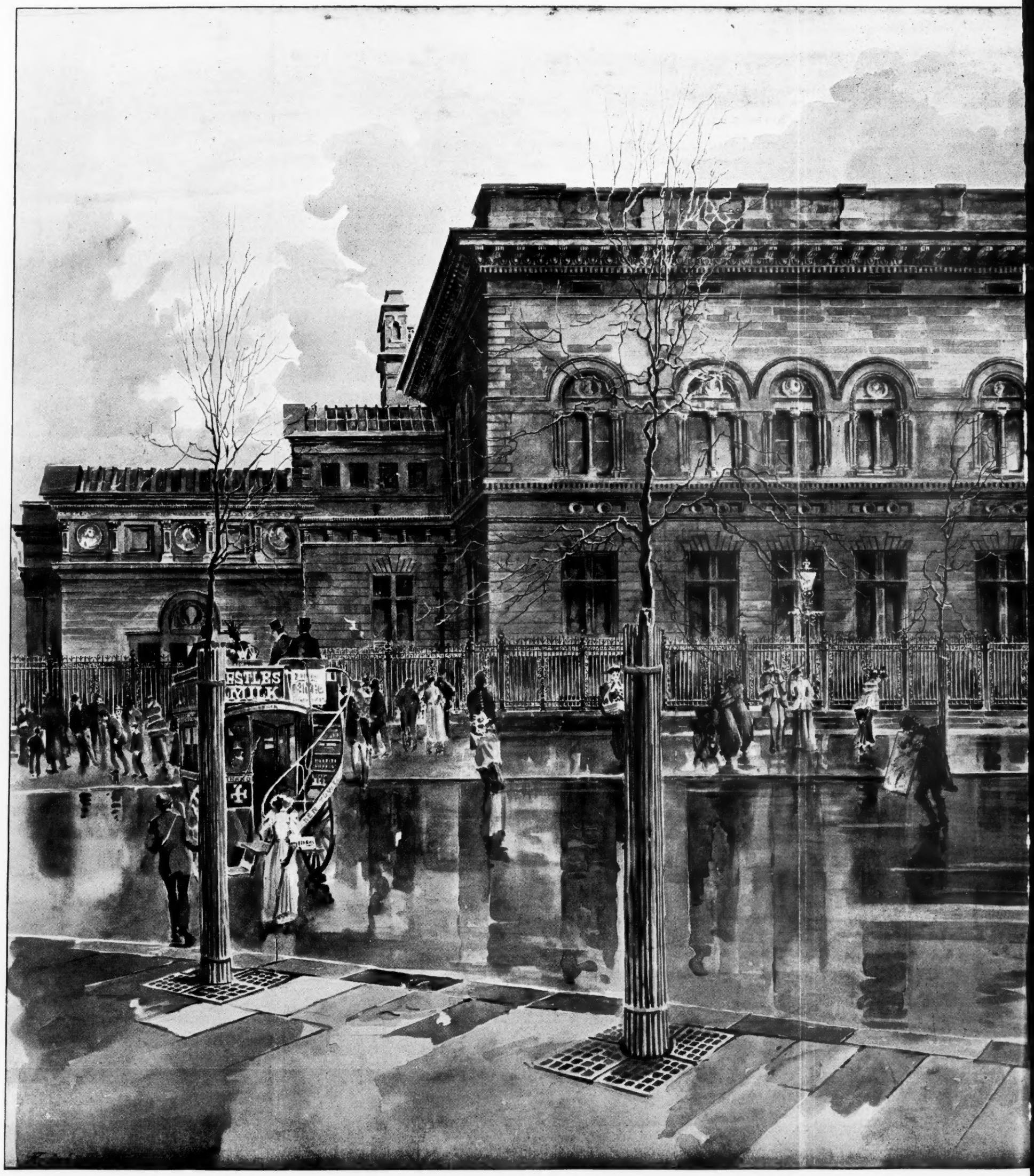
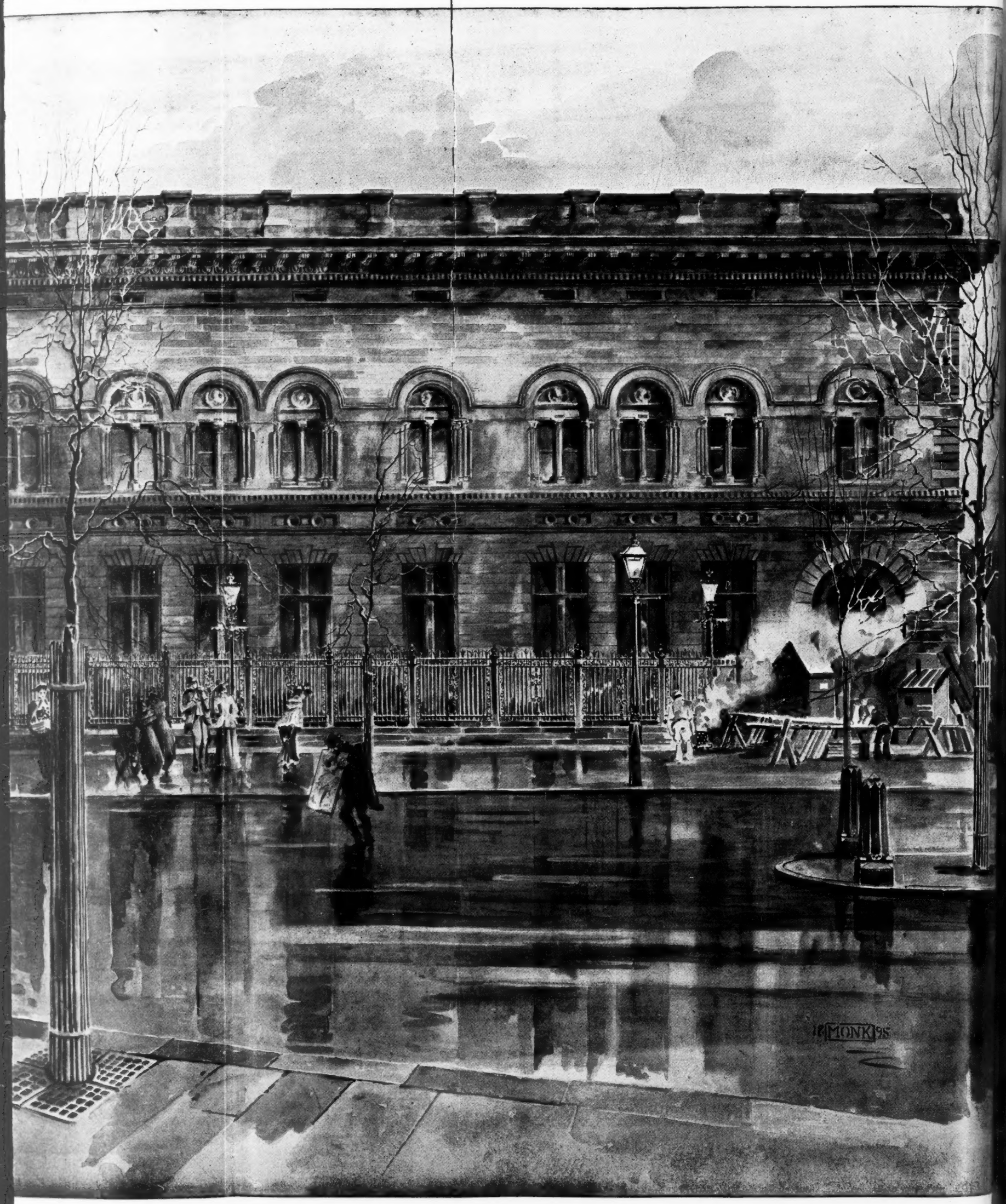


THE NATIONAL PORTRAIT GALLERY.—The late Mr. Ewan Christian, Archite



TIONAL PORTRAIT GALLERY.—THE LATE MR. EWAN CHRISTIAN, ARCHITECT.

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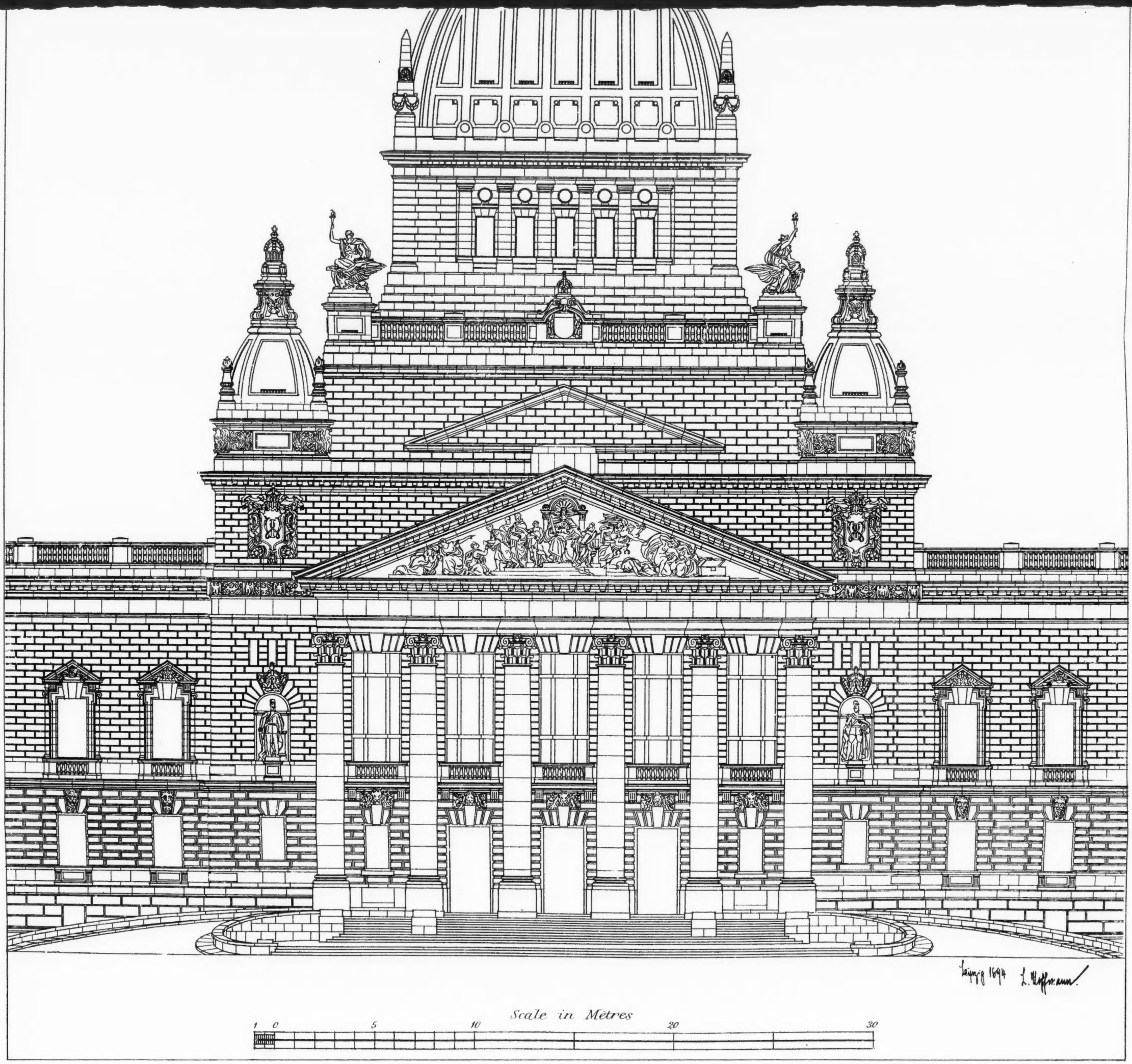
LUDGATE IN THE TIME OF HENRY VIII.—From a Drawing by Mr. H. W. Brewer.



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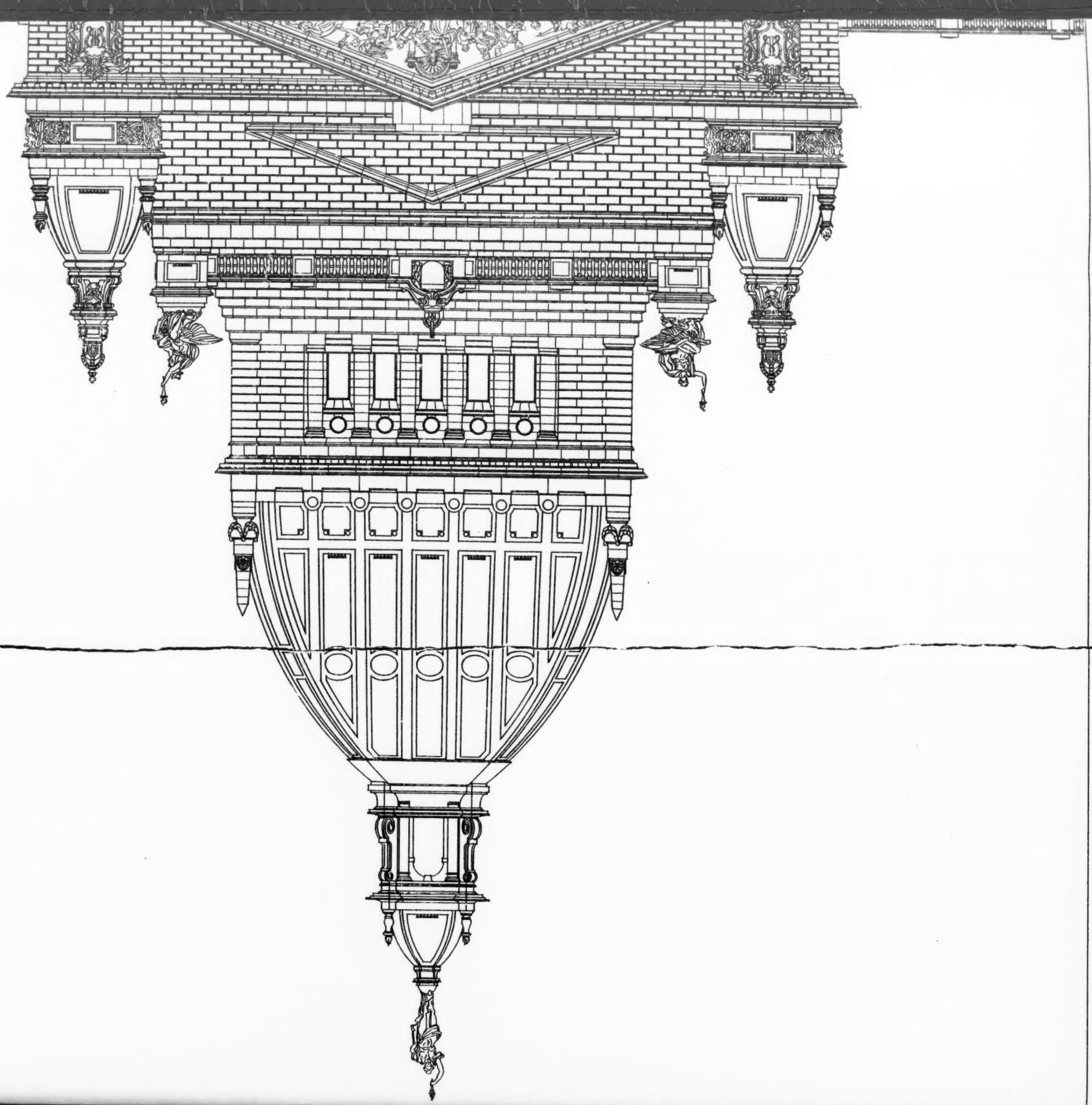
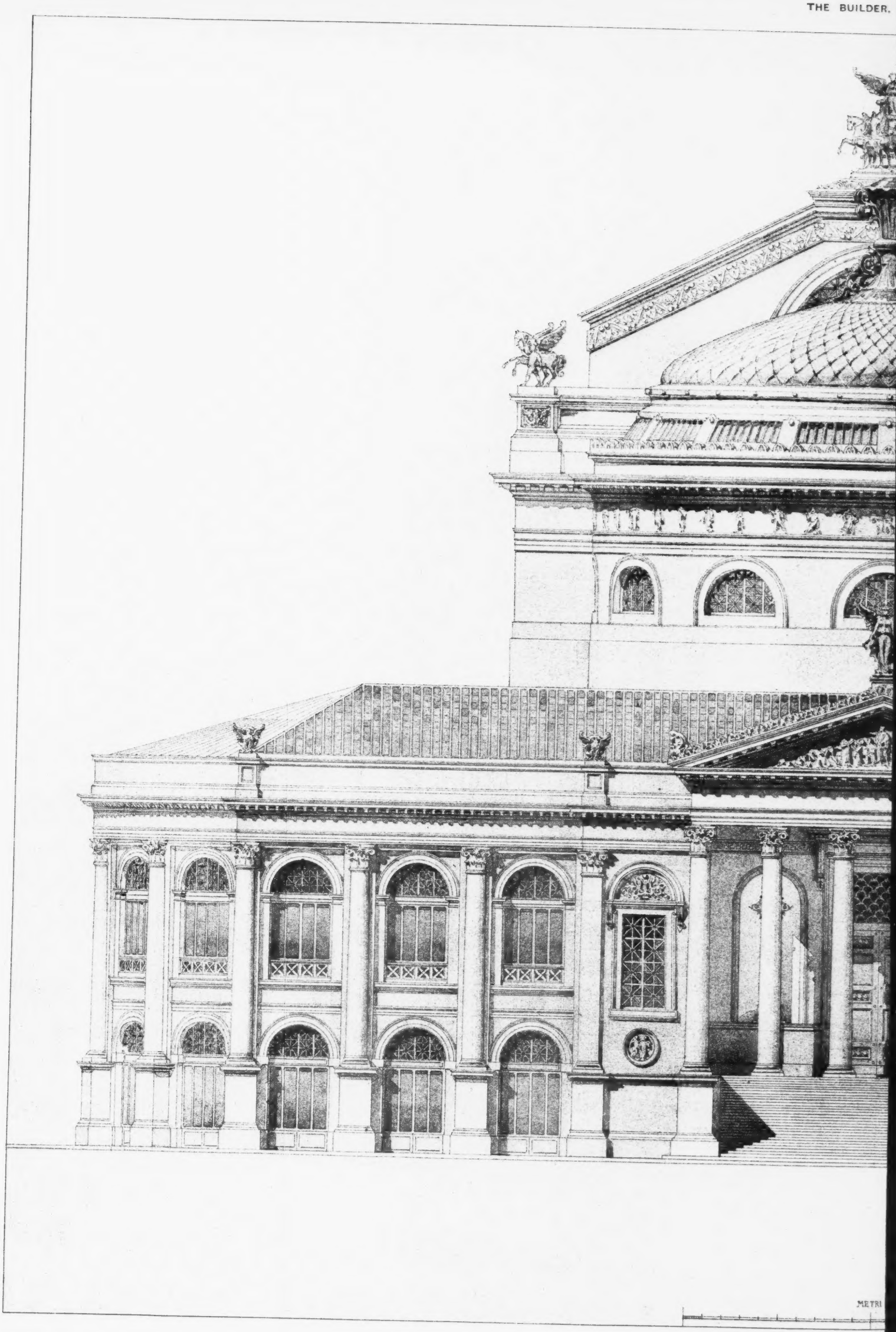
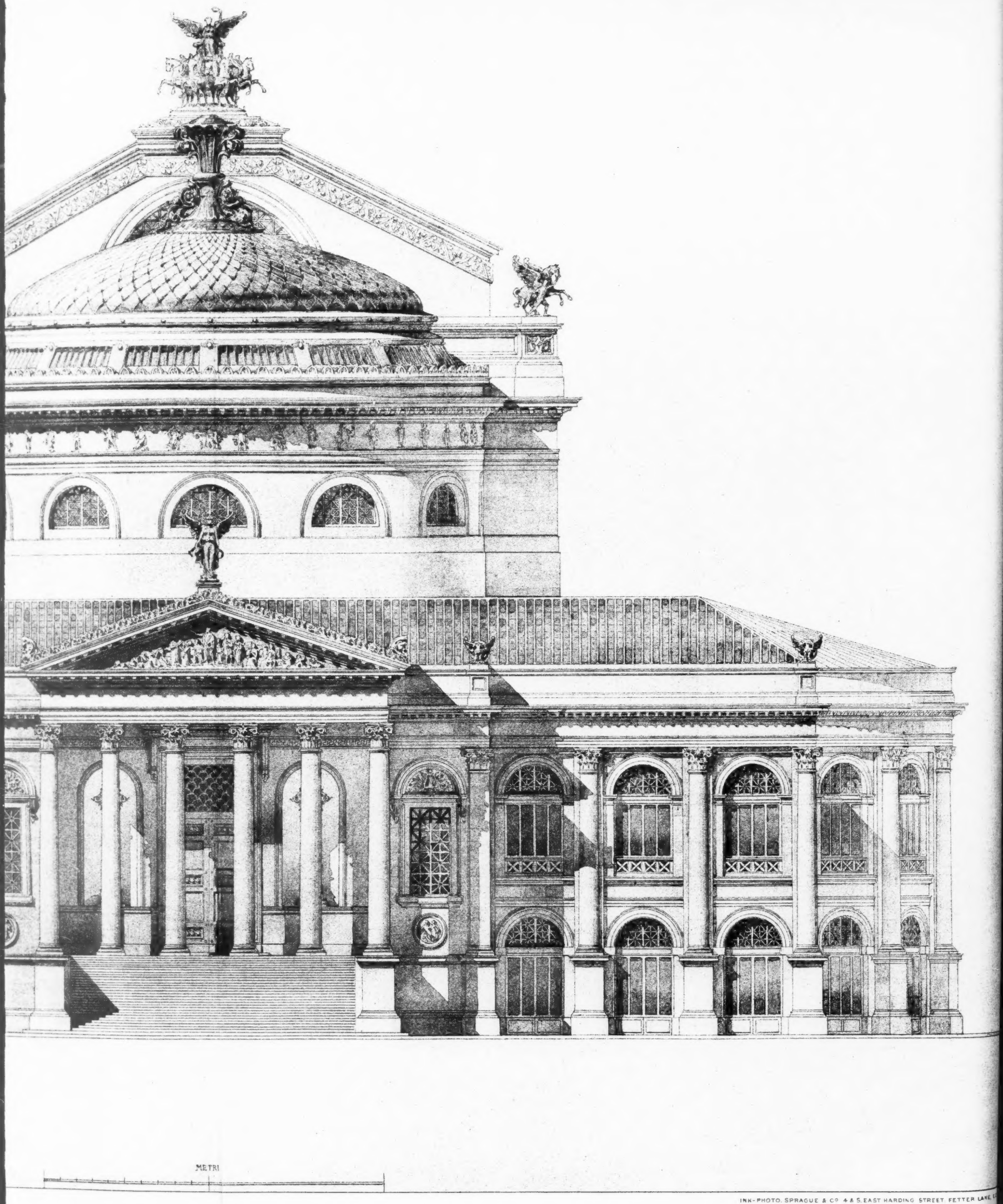
THE IMPERIAL LAW COURTS, LEIPSIC: ELEVATION OF CENTRE OF PRINCIPAL FRONT.—Herr Ludwig Hoffmann, Architect.





METRI

VITTORIO EMANUELE THEATRE, PALERMO: PRINC



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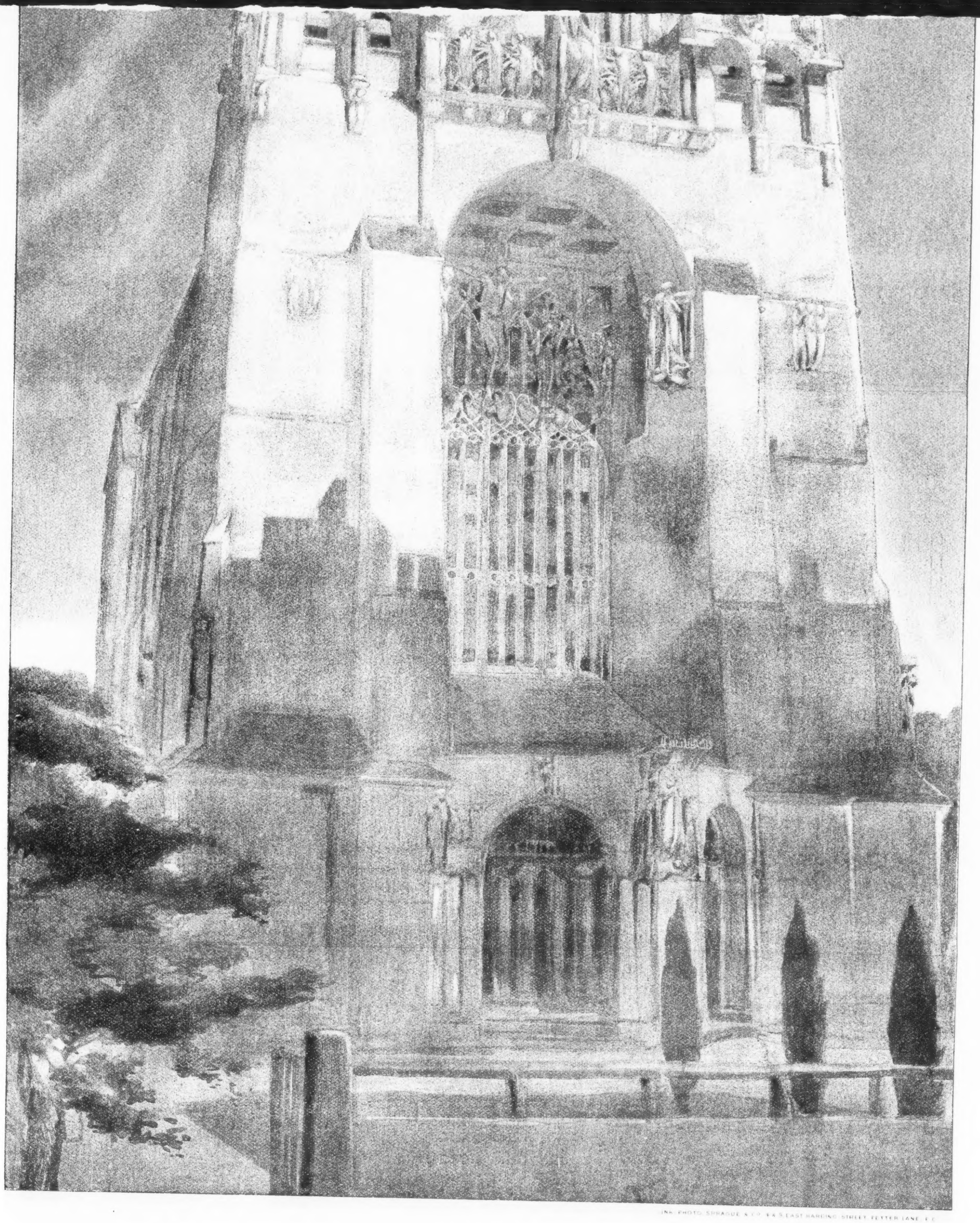
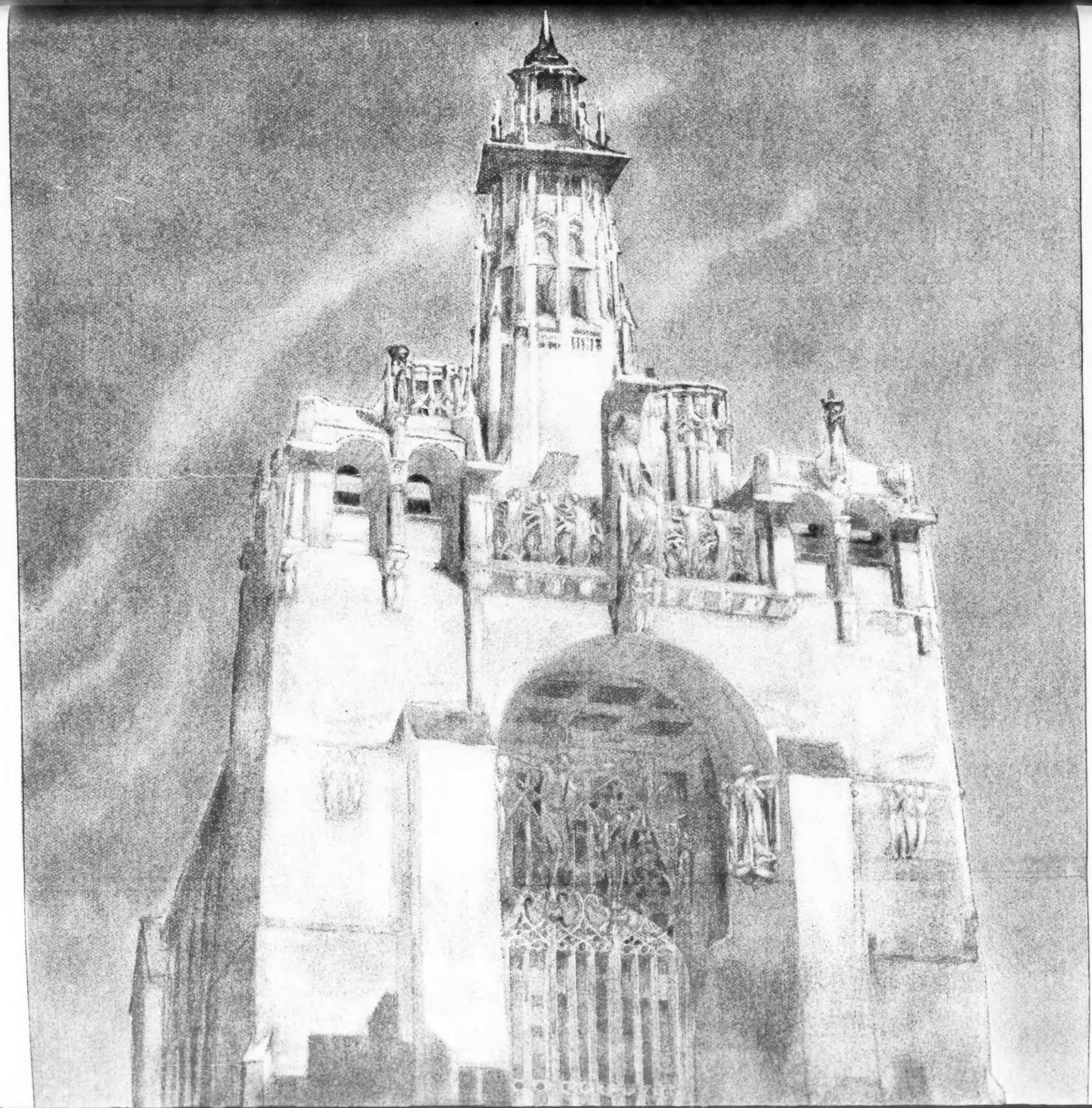
ELE THEATRE, PALERMO: PRINCIPAL ELEVATION.—Signor G. B. F. Basile, Architect.



STUDY FOR WEST FRONT OF PROPOSED CHURCH OF ST ANDREW, BOSCOMBE.—Mr H. Wilson, Architect.